

Service Manual

Multi-Scan Color CRT Display

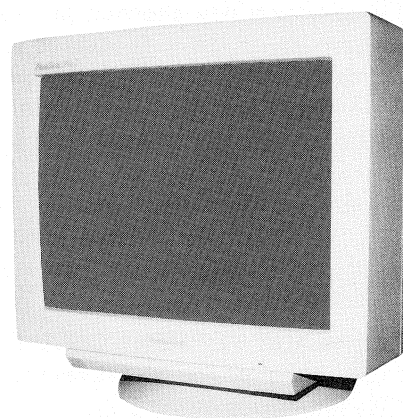
TX-D2151 Series

Chassis No. HV4S

Chassis Family No.21HV4S

MODEL NO.

TX-D2151-G
TX-D2151-U
TX-D2151-SW
TX-D2151NM



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Panasonic

Matsushita Electric Industrial Co., Ltd.
Display Monitor Division

SAFETY PRECAUTIONS

1 CAUTION:

No modification of any circuit should be attempted. Service work should only be performed after you are thoroughly familiar with all of the following safety checks and servicing guide lines.

2 SAFETY CHECK

Care should be taken while servicing this CRT display because of the high voltage used in the deflection circuits. These voltages are exposed in such areas as the associated flyback and yoke circuits.

3 FIRE & SHOCK HAZARD

- 3-1 Insert an isolation transformer between the CRT display and AC power line before servicing the chassis.
- 3-2 In servicing pay attention to original lead dress especially in the high voltage circuit. If a short circuit is found, replace all parts which have been overheated as a result of the short circuit.
- 3-3 All the protective devices must be reinstalled per original design.
- 3-4 Soldering must be inspected for possible cold solder joints, frayed leads, damaged insulation, solder splashes or sharp solder points. Be certain to remove all foreign material.

4 LEAKAGE CURRENT COLD CHECK

- 4-1 Unplug the AC cord and connect a jumper between the two prongs on the plug.
- 4-2 Turn the CRT display power switch "on"
- 4-3 Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metallic part on the CRT display such as the metal frame, screwheads, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be 1.8 megohm minimum.

5 LEAKAGE CURRENT HOT CHECK

- 5-1 Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during this check.
- 5-2 Connect a 1500 ohm, 10 watt resistor, paralleled by a 0.15 μ F capacitor between each exposed metallic part and a good earth ground (as shown in Fig.1).
- 5-3 Use an AC voltmeter with 1000 ohm/volt or more sensitivity and measure the AC voltage across the combination 1500 ohm resistor and 0.15 μ F capacitor.
- 5-4 Move the resistor connection to each exposed metallic part and measure the voltage.
- 5-5 Reverse the polarity of the AC plug in the AC outlet and repeat the above measurement.
- 5-6 Voltage measured must not exceed 7.5 volt RMS, from any exposed metallic part to ground. A leakage current tester may be used in the above hot check, in which case any current measured must not exceed 5.0 milliamp. In the case of a measurement exceeding the 5.0 milliamp value, a rework is required to eliminate the chance of a shock hazard.

Note: High voltage is present when this CRT display is operating. Always discharge the anode of the picture tube to the display chassis to prevent shock hazard.

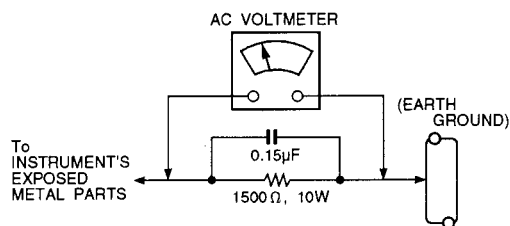


Fig. 1

6 IMPLOSION PROTECTION


All Panasonic picture tubes are equipped with an integral implosion protection system, but care should be taken to avoid damage and scratching during installation. Use only Panasonic replacement picture tubes.

7 X-RADIATION

WARNING : The only potential source of X-Radiation is the picture tube. However when the high voltage circuitry is operating properly there is no possibility of X-Radiation problem. The basic precaution which must be exercised is to keep the high voltage at the following factory-recommended level.

Note: It is important to use an accurate periodically calibrated high voltage meter.

IMPORTANT SAFETY NOTICE

There are special components used in this CRT displays which are important for safety. These parts are identified by the international symbol  on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacture's specified parts to prevent X-RADIATION, shock, fire or other hazards. Do not modify the original design without written permission of the Panasonic Industrial Company or this will void the original parts and labor guarantee.

SERVICE WARNING

TO PREVENT RISK OF ELECTRIC HAZARD, TEST BEFORE TOUCHING. Where, after operation of the fuse in the live side of the mains supply, some components of the equipment that remain under voltage might represent a hazard during servicing.

GENERAL INFORMATION

1. OUTLINE

TX-D2151 is 21 inch (20"V) multi-scan color CRT display with the following nice features.

OSD (on screen display) Control is newly introduced, which allows easy user adjustment.

Power saving function, which helps saving energy, is also one of the highlights of this model.

2. FEATURES

2-1 Power Saving

- Built in Power Saving function based on VESA-DPMS standard.
- Power energy shall be saved by controlling the circuit in accordance with power save signal from computer.

2-2 OSD function

- OSD (on screen display) function is new and excellent man-machine interface.
Any one is able to set up the picture as he like through OSD menu.

2-3 Self Test function

- Self Testing picture comes out by pushing [1]-key in the case of no-connection with computer or power saving operation.
This function shows if monitor is alive or not and can be used for self aging test.

2-4 Power Supply with high power factor

- Power Supply with high power factor enables to utilize AC power efficiently and it will meet IEC555-2.

2-5 Ergonomic design

- Low emission design to meet MPR II
- ESF (Electro static field) free coating on CRT

2-6 Multi scan with digital technology

- 8 bit micro computer controls the circuit operation to meet with wide range signal of $f_H=30\sim 82\text{kHz}$ and $f_V=50\sim 160\text{Hz}$. So VGA640x350, VGA640x400, VGA640x480, SVGA800x600, 1024x768, 1152x900 and 1280x1024 mode are applicable.

2-7 3 Factory presets, 5 Reservation settings, 13 User Memory settings.

- 3 standard modes are preset at the factory.
- 5 modes are reserved at the factory.
- 13 user memories are available to set the users own timing and display information.

2-8 Flat Face and fine dot pitch

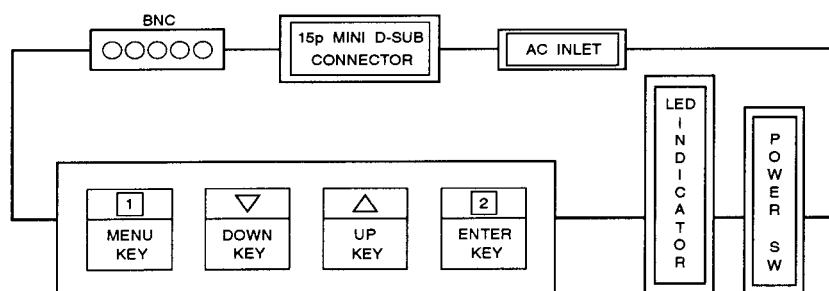
- Flat face CRT with fine dot pitch 0.25mm gives a comfortable sight of the screen.

2-9 Superior display performance

- Good focus by sophisticated gun and dynamic focus circuit
- High brightness
- Minimized distortion by correction circuit
- Good convergence
- Users enjoy full scan image for graphics

SPECIFICATION

1. DIAGRAM



3.1 POWER SW, LED, [1]-key (MENU), ▽-key (DOWN), △-key (UP), and [2]-key (ENTER) are located on the front panel.

3.2 Signal connectors and AC inlet are located on the back side of the cabinet.

3.3 OSD menu includes the following function.
CONTRAST, BRIGHTNESS, H/V SIZE, H/V POSITION, V. PIN-CUSHION, TRAPEZOID, DEGAUSS, PARALLELOGRAM, COLOR SELECT, USER COLOR, VIDEO INPUT LEVEL, VIDEO INPUT

SELECT, H/V. MOIRE REDUCTION, ROTATION, DISPLAY FREQUENCY, RECALL.

- CONTRAST can be directly controlled with ▽/△-key.
- VIDEO INPUT SELECT can be directly controlled by pushing [2]-key.
- With sync signal, OSD menu appears by pushing [1]-key.

With sync signal, self test menu appears by pushing [1]-key.

2. MECHANICAL SPECIFICATIONS

..... refer to the attached drawing

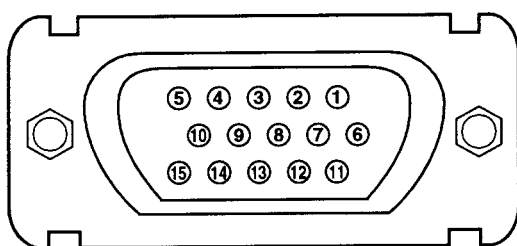
- 2.1 Dimension Height : 478 mm (18.8") typ.
 Width : 505 mm (19.9") typ.
 Depth : 510 mm (20.1") typ.

- 2.2 Net Weight : 28.0kg (58.5 lbs) typ.

3. CONNECTORS

- 3.1 Signal connector: 15P Mini D-Sub X 1
 BNC connector X15
 3.2 AC inlet: CEE 22 typed connector

15P Mini D-Sub Pin assignment



- | | | |
|----------------|----------------|-----------------|
| 1 ... RED | 6 ... GROUND | 11 ... GROUND |
| 2 ... GREEN | 7 ... GROUND | 12 ... - (OPEN) |
| 3 ... BLUE | 8 ... GROUND | 13 ... H.SYNC. |
| 4 ... GROUND | 9 ... - (OPEN) | 14 ... V.SYNC. |
| 5 ... - (OPEN) | 10 ... GROUND | 15 ... - (OPEN) |

4. CRT SPECIFICATIONS

Part No.	M51KYY140X
Type	21" (19.67" viewable) diagonal
Dot Pitch	0.25 mm
Phosphor	R, G, B Short Persistence
Bulb	DARK TINT
Face	AGRAS COAT
Total Transmission	39.5%

5. ELECTRICAL SPECIFICATIONS

5.1 Standard conditions ... Except special items

Display image	Green, full "H" characters with a border 1x line. (7 x 9 dots) Video signal : 100% duty display area : 380mm x 285mm
Video signal level	0.7Vpp
Contrast, Brightness	Contrast : Max., Brightness : center point
Ambient Temperature	20 ± 5°C (68 ± 9°F)
Input Voltage	AC 120V, 60Hz
Terrestrial magnetism	Vertical field : northern hemisphere field (40μT) Horizontal field : no field
Viewing direction	Parallel to the CRT axis
Measurements	After an initial warming up time of more than 30 minutes.
Ambient light	200 ± 50 lx
Display mode	MODE2 1024 x 768 (60.0kHz, 75Hz)

5.2.1 Power supply ... Commercial power source

Input voltage	AC90 - 264V
Power frequency	50/60 Hz
Input current	1.7A Max. (100V) (*1)
Inrush current (at 20°C)	40 Aop
Power consumption	150W (Typ)

(*1) Input current is reduced to about 60% of our current products by 'High Power Factor' technology.

5.2.2 Power Management for Power Saving ...

Power saving system is designed based upon VESA DPMS Standard (Version : 1.0)

1) Power consumption and recovery time.

*1 APM State	SIGNALS			MONITOR POWER CONSUMP- TION	RECOVERY TIME TO ON STATE	INDICATOR
	H. Sync	V. Sync	VIDEO			
ON	*3 NOR- MAL	*3 NOR- MAL	*2 ACTIVE	*4 100%	—	Green
STAND- BY	No Sync or *5 < 6Hz	> 40Hz	BLANK	< 30W	< 4s	Yellow
SUS- PEND	> 10kHz	No Sync or *5 < 20Hz	BLANK	< 30W	< 4s	Yellow
OFF	No Sync or *5 < 6Hz	No Sync or *5 < 20Hz	BLANK	< 8W	< 20s	Yellow

** The transition time from ON state to each APM states is 5 seconds minimum.

*1 : APM : Advanced Power Management.

*2 : Meas. Condition of power consumption for ON state.

DISPLAY IMAGE : WHITE full "H" characters with a border line (7 × 9 dots).

*3 : NORMAL : see "5.4 ACCEPTABLE TIMING".

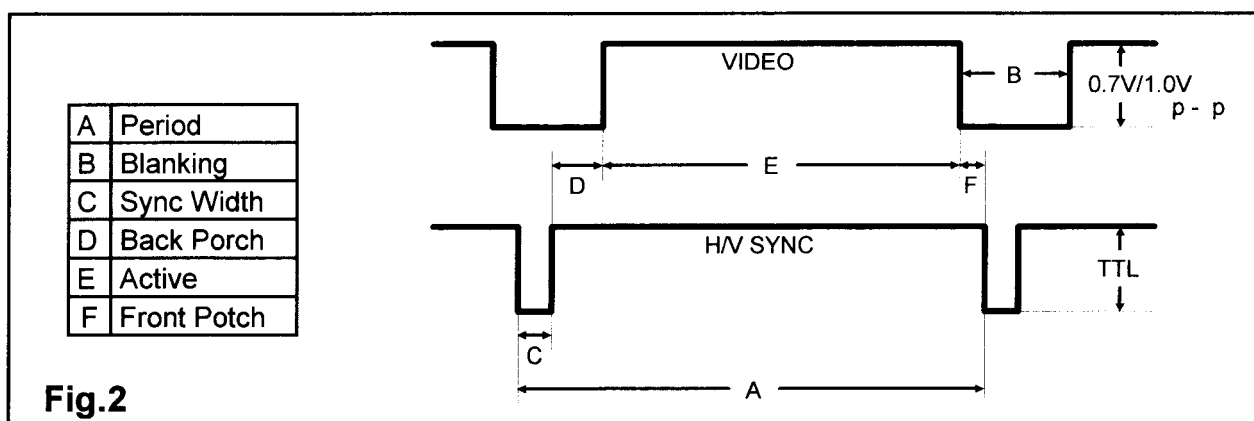
*4 : Power Consumption is measured at AC 100-240V.

*5 : Power saving operation is done at least less than specified value in the list.

5.3 Standard timing

- Following total 8 modes are preset in the memory as standard timing at the factory.
- Refer to Fig. 2 as a definition of timing and signal level.
- This SPECIFICATION is specified at STD (1024 x 768) mode unless otherwise mentioned.

TIMING CHART



FOR PRESET

		MODE - 1	MODE - 2	MODE - 3
		640 X 480 (60)	1024 X 768 (75)	1280 X 1024 (75)
DOT CLOCK		25.1745 MHz	78.7500 MHz	135.0000 MHz
H	f H	31.4681 KHz	60.0229 KHz	79.9763 KHz
	A - PERIOD	31.778 μ s (800 dots)	16.660 μ s (1,312 dots)	12.504 μ s (1,688 dots)
	B - BLANKING TIME	6.356 μ s (160 dots)	3.657 μ s (288 dots)	3.022 μ s (408 dots)
	C - SYNC WIDTH	3.813 μ s (96 dots)	1.219 μ s (96 dots)	1.067 μ s (144 dots)
	D - BACK PORCH	1.907 μ s (48 dots)	2.235 μ s (176 dots)	1.837 μ s (248 dots)
	E - ACTIVE TIME	25.423 μ s (640 dots)	13.003 μ s (1,024 dots)	9.481 μ s (1,280 dots)
	F - FRONT PORCH	0.636 μ s (16 dots)	0.203 μ s (16 dots)	0.119 μ s (16 dots)
V	f V	59.9393 Hz	75.0286 Hz	75.0247 Hz
	A - PERIOD	16.684 ms (525 lines)	13.328 ms (800 lines)	13.329 ms (1,066 lines)
	B - BLANKING TIME	1.430 ms (45 lines)	0.533 ms (32 lines)	0.525 ms (42 lines)
	C - SYNC WIDTH	0.064 ms (2 lines)	0.050 ms (3 lines)	0.038 ms (3 lines)
	D - BACK PORCH	1.049 ms (33 lines)	0.466 ms (28 lines)	0.475 ms (38 lines)
	E - ACTIVE TIME	15.254 ms (480 lines)	12.795 ms (768 lines)	12.804 ms (1,024 lines)
	F - FRONT PORCH	0.318 ms (10 lines)	0.017 ms (1 lines)	0.013 ms (1 lines)
SYNC POLARITY(H/V)		Negative / Negative	Positive / Positive	Positive / Positive

FOR RESERVATION

		MODE - 4	MODE - 5	MODE - 6
		640 X 480 (75)	800 X 600 (75)	1024 X 768 (70)
DOT CLOCK		31.5000 MHz	49.5000 MHz	75.0000 MHz
H	f H	37.5000 KHz	46.8750 KHz	56.4759 KHz
	A - PERIOD	26.667 μ s (840 dots)	21.333 μ s (1,056 dots)	17.707 μ s (1,328 dots)
	B - BLANKING TIME	6.349 μ s (200 dots)	5.172 μ s (256 dots)	4.053 μ s (304 dots)
	C - SYNC WIDTH	2.032 μ s (64 dots)	1.616 μ s (80 dots)	1.813 μ s (136 dots)
	D - BACK PORCH	3.810 μ s (120 dots)	3.232 μ s (160 dots)	1.920 μ s (144 dots)
	E - ACTIVE TIME	20.317 μ s (640 dots)	16.162 μ s (800 dots)	13.653 μ s (1,024 dots)
	F - FRONT PORCH	0.508 μ s (16 dots)	0.323 μ s (16 dots)	0.320 μ s (24 dots)
V	f V	75.0000 Hz	75.0000 Hz	70.0694 Hz
	A - PERIOD	13.333 ms (500 lines)	13.333 ms (625 lines)	14.272 ms (806 lines)
	B - BLANKING TIME	0.533 ms (20 lines)	0.533 ms (25 lines)	0.673 ms (38 lines)
	C - SYNC WIDTH	0.080 ms (3 lines)	0.064 ms (3 lines)	0.106 ms (6 lines)
	D - BACK PORCH	0.427 ms (16 lines)	0.448 ms (21 lines)	0.513 ms (29 lines)
	E - ACTIVE TIME	12.800 ms (480 lines)	12.800 ms (600 lines)	13.599 ms (768 lines)
	F - FRONT PORCH	0.027 ms (1 lines)	0.021 ms (1 lines)	0.053 ms (3 lines)
SYNC POLARITY(H/V)		Negative / Negative	Positive / Positive	Negative / Negative

FOR RESERVATION

		MODE - 7	MODE - 8
		1152 X 870 (75)	1280 X 1024 (60)
DOT CLOCK		100.0000 MHz	109.4695 MHz
H	f H	68.6813 KHz	63.7192 KHz
	A - PERIOD	14.560 μ s (1,456 dots)	15.694 μ s (1,718 dots)
	B - BLANKING TIME	3.040 μ s (304 dots)	4.001 μ s (438 dots)
	C - SYNC WIDTH	1.280 μ s (128 dots)	1.425 μ s (156 dots)
	D - BACK PORCH	1.200 μ s (120 dots)	2.174 μ s (238 dots)
	E - ACTIVE TIME	11.520 μ s (1,152 dots)	11.693 μ s (1,280 dots)
	F - FRONT PORCH	0.560 μ s (56 dots)	0.402 μ s (44 dots)
V	f V	75.0616 Hz	59.9992 Hz
	A - PERIOD	13.322 ms (915 lines)	16.667 ms (1,062 lines)
	B - BLANKING TIME	0.655 ms (45 lines)	0.596 ms (38 lines)
	C - SYNC WIDTH	0.044 ms (3 lines)	0.047 ms (3 lines)
	D - BACK PORCH	0.568 ms (39 lines)	0.502 ms (32 lines)
	E - ACTIVE TIME	12.667 ms (870 lines)	16.071 ms (1,024 lines)
	F - FRONT PORCH	0.044 ms (3 lines)	0.047 ms (3 lines)
SYNC POLARITY(H/V)		Negative / Negative	Sync on Green

FOR ADJUSTMENT

		HV4S - 1 (HV4 - 1) (HV4H - 1)	HV4S - 2 (HV4H - 2)	HV4S - 4 (HV4 - 4) (HV4H - 4)
DOT CLOCK		22.6000 MHz	40.2480 MHz	86.0645 MHz
H	f H	29.5039 KHz	39.0000 KHz	64.5200 KHz
	A - PERIOD	33.894 μ s (766 dots)	25.641 μ s (1,032 dots)	15.500 μ s (1,334 dots)
	B - BLANKING TIME	6.018 μ s (136 dots)	5.988 μ s (241 dots)	3.602 μ s (310 dots)
	C - SYNC WIDTH	4.115 μ s (93 dots)	2.832 μ s (114 dots)	1.185 μ s (102 dots)
	D - BACK PORCH	1.283 μ s (29 dots)	2.435 μ s (98 dots)	1.975 μ s (170 dots)
	E - ACTIVE TIME	27.876 μ s (630 dots)	19.653 μ s (791 dots)	11.898 μ s (1,024 dots)
	F - FRONT PORCH	0.619 μ s (14 dots)	0.721 μ s (29 dots)	0.442 μ s (38 dots)
V	f V	48.0520 Hz	77.0751 Hz	105.0814 Hz
	A - PERIOD	20.811 ms (614 lines)	12.974 ms (506 lines)	9.516 ms (614 lines)
	B - BLANKING TIME	0.915 ms (27 lines)	0.744 ms (29 lines)	0.480 ms (31 lines)
	C - SYNC WIDTH	0.102 ms (3 lines)	0.103 ms (4 lines)	0.046 ms (3 lines)
	D - BACK PORCH	0.712 ms (21 lines)	0.513 ms (20 lines)	0.356 ms (23 lines)
	E - ACTIVE TIME	19.896 ms (587 lines)	12.231 ms (477 lines)	9.036 ms (583 lines)
	F - FRONT PORCH	0.102 ms (3 lines)	0.128 ms (5 lines)	0.077 ms (5 lines)
SYNC POLARITY(H/V)		Negative / Negative	Negative / Negative	Negative / Negative

FOR ADJUSTMENT

		HV4S - 5 (HV4 - 5) (HV4H - 5)
DOT CLOCK		134.9800 MHz
H	f H	82.5061 KHz
	A - PERIOD	12.120 μ s (1,636 dots)
	B - BLANKING TIME	2.904 μ s (392 dots)
	C - SYNC WIDTH	1.096 μ s (148 dots)
	D - BACK PORCH	1.526 μ s (206 dots)
	E - ACTIVE TIME	9.216 μ s (1,244 dots)
	F - FRONT PORCH	0.282 μ s (38 dots)
V	f V	165.0122 Hz
	A - PERIOD	6.060 ms (500 lines)
	B - BLANKING TIME	0.497 ms (41 lines)
	C - SYNC WIDTH	0.036 ms (3 lines)
	D - BACK PORCH	0.376 ms (31 lines)
	E - ACTIVE TIME	5.563 ms (459 lines)
	F - FRONT PORCH	0.085 ms (7 lines)
SYNC POLARITY(H/V)		Negative / Negative

5.4 Acceptable timing

5.4.1 If your timing is within following specification, this CRT display can automatically function with a certain size and position.

Horizontal: Sync frequency: 30.0 ~ 82.0 kHz

Blanking Time: $\geq 3.0 \mu\text{S}$

Back Porch: $\geq 1.25 \mu\text{S}$

Front Porch: \leq Back Porch

Sync Width: $\geq 1.2 \mu\text{S}$

Vertical: Sync frequency: 50.0 ~ 160.0 Hz

Blanking Time: $\geq 0.5 \text{ mS}$

Back Porch: $\geq 0.5 \text{ mS}$

Sync Width: $\geq 0.045 \text{ mS}$

5.4.2 • Several items like size, position and distortion can be adjusted through OSD menu, and if you want to keep it, please push the key [1] for memory, or keep the key untouched for about 20 seconds, it is automatically memorized.

NOTE : In case of RECALL, the keys is untouched for about 30 seconds, RECALL function will be cancelled.

Please notice, however, that there is the case you can not get the size and/or position you want, (for example Display Time is too short, then you can't get bigger size of the image.)

5.4.3 The CRT adopted in this CRT display is designed to minimize the moire phenomenon at suitable size for typical display modes. However, there might be a display format among many formats, in which the moire phenomenon appears on this display.

5.5 Signal level and input impedance

5.5.1 Video signal level

This CRT display is adjusted at the factory using 0.7Vp-p/1.0Vp-p video signal, black level is 0V.

5.5.2 Sync signal level

- H/V Separate, H/V Mixed : TTL level
- Sync on Green : 0.286 Vpp

5.5.3 Input impedance

Video input: 75Ω

Sync input: $\geq 1 \text{ k}\Omega$

5.6 Display performance

5.6.1 Display area

1) PRESET TIMING

MODE1, 2

WIDTH : $380\text{mm} \pm 5\text{mm}$

HEIGHT : $285\text{mm} \pm 5\text{mm}$

MODE3

WIDTH : $355\text{mm} \pm 5\text{mm}$

HEIGHT : $284\text{mm} \pm 5\text{mm}$

2) RESERVATION TIMING

MODE4~7

WIDTH : $380\text{mm} \pm 7\text{mm}$

HEIGHT : $285\text{mm} \pm 7\text{mm}$

MODE8

WIDTH : $355\text{mm} \pm 7\text{mm}$

HEIGHT : $284\text{mm} \pm 7\text{mm}$

3) DISPLAY AREA (Full scan)

WIDTH : 402mm

HEIGHT : 301mm

5.6.2 Centering

1) PRESET TIMING (MODE1~3)

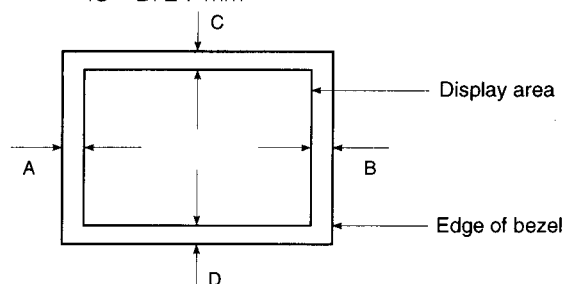
$IA - BI \leq 4 \text{ mm}$

$IC - DI \leq 4 \text{ mm}$

2) RESERVATION TIMING (MODE 4~8)

$IA - BI \leq 7 \text{ mm}$

$IC - DI \leq 7 \text{ mm}$

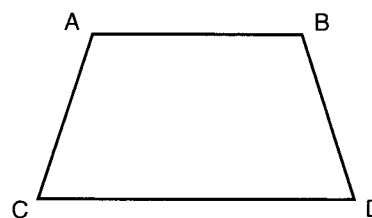


5.6.3 Distortion

5.6.3. a) Trapezoid

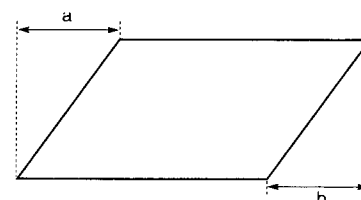
$|AC - BD| \leq 3\text{mm}$

$|AB - CD| \leq 4\text{mm}$



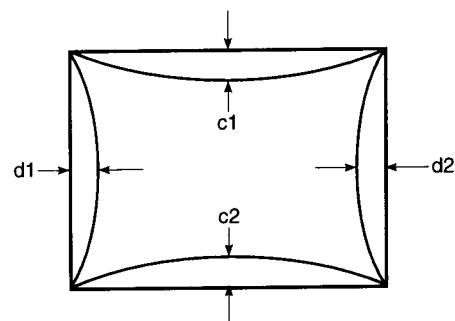
b) Parallelogram

$a, b \leq 3\text{mm}$



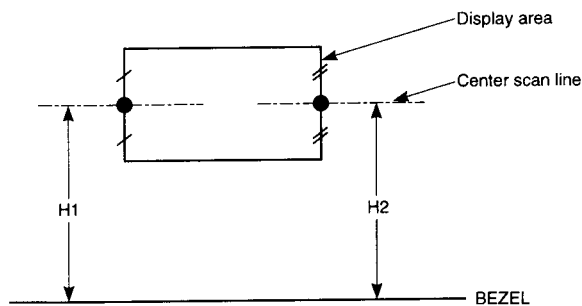
5.6.3. c Pincushion and barrel

$|C1|, |C2| \leq 3.0 \text{ mm}$
 $|d1|, |d2| \leq 3.0 \text{ mm}$



5.6.4 Rotation

$|H1 - H2| \leq 2.5 \text{ mm}$



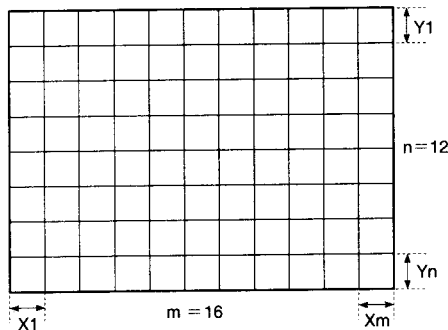
5.6.5 Linearity

Horizontal linearity

$$= \frac{X \text{ max.} - X \text{ min.}}{X \text{ max.} + X \text{ min.}} \times 100\% \leq 6\%$$

Vertical linearity

$$= \frac{Y \text{ max.} - Y \text{ min.}}{Y \text{ max.} + Y \text{ min.}} \times 100\% \leq 5\%$$



Conditions

Display image – crosshatch pattern

Maximum and minimum values should not be adjacent to each other.

X max. is maximum value among X1~Xm

X min. is minimum value among X1~Xm

Y max. is maximum value among Y1~Yn

Y min. is minimum value among Y1~Yn

5.7 General performance

5.7.1 Video output

Bandwidth	135MHz (Typ)
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5.7.2 Maximum luminance

Value	100 cd/m ² (min.) for 5% white field at the center of the display area. 90cd/m ² (min.) for 100% white field at the center of the display area. Specified by 9300K + 27MPCD
Conditions	Luminance : Max. (Contrast : Max.) (Brightness : Center)

5.7.3 Minimum luminance

Value	$\leq 17 \text{ cd/m}^2$ at the center of the display area. Specified by 9300K + 27MPCD
Conditions	Display image : White full flat field Luminance : Min. (Contrast : Min.) (Brightness : Center)

5.7.4 Brightness variation

Value	65% (Min.) Variation = C/A X 100
Conditions	Display image : White full flat field Luminance : MAX (Contrast : MAX) (Brightness : Center) A ; Luminance at center position C ; Luminance at center position of lowest brightness

5.7.5 Display area regulation

	Display area variation	Range of variation
Due to Luminance	within 1.0% of display area (white flat field)	17~100 cd/m ²
Due to Power Supply	within 1.0% of display area	AC : 90 - 132V or 180 - 264V
Due to Temperature	within 1.5% of display area	0 - 40°C

5.7.6 Color Point

< Conditions >

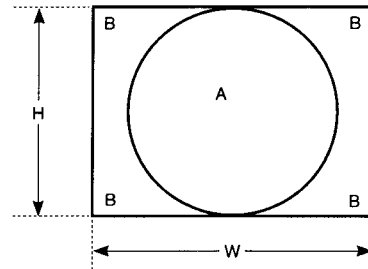
Display image : White flat field at the center of the display area.

Luminance : Brightness Center.

Contrast	max	min
Value	9300K + 27 MPCD $x = 0.281 \pm 0.020$ $y = 0.311 \pm 0.020$	9300K + 27 MPCD $x = 0.281 \pm 0.020$ $y = 0.311 \pm 0.020$

5.7.7 Misconvergence

Center area of display (A) : 0.4 mm (Max.)
 Corner area of display (B) : 0.45 mm (Max.)



<Conditions>

Display image : Crosshatch pattern mixed with R, G and B colors.

Convergence gauge : KLEIN CM7AG

Display image : W x H 380 x 285mm

5.7.8 Purity

Conspicuous mis-landing shall not be visible within the display area at a distance of 60cm from CRT surface.

Conditions:

Display image : White flat field

Luminance : Contrast max, Brightness Center.

5.7.9 Jitter

Invisible at a distance of 60 cm from CRT surface.

Conditions:

Display image : White flat field

Luminance : Contrast max, Brightness Center point.

6. ENVIRONMENTS

6.1 Ambient temperature, humidity and altitude

	Operating	Storage and shipment
Temperature	0°~40°C (32°~104°F)	-20°~+60°C (-4°~140°F)
Humidity	5~90%*	5~90%*
Altitude	3,000m (Max.) (10,000 ft)	12,000m (Max.) (40,000 ft)

*Non-condensation

6.2 Vibration and shock

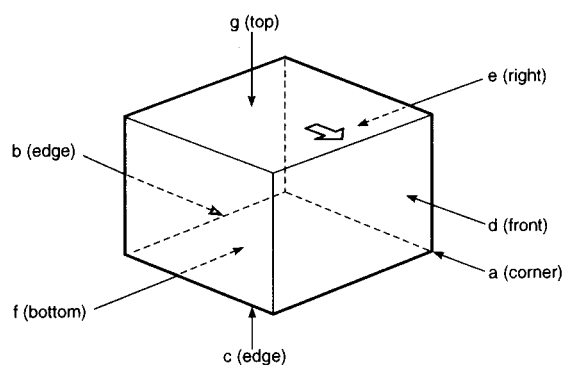
(1) Vibration

vibration

	Order of tests	Direction of vibration		Acceleration		Frequency	Sweep	Test time
				Non-operation	Storage and shipment			
Unpacked	1	Vertical	Up to down	2.9 m/s ² (0.3 G)		5 - 55 Hz	120 S	30 min.
	2	Horizontal	Front to back					15 min.
	3		Right to left					
Packed	1	Vertical	Up to down		10m/s ² (1.0 G)	5 - 50 Hz	Logsweep 810 S	40 min.
	2	Horizontal	Front to back	5 m/s ² (0.5 G)	20 min.			
	3		Right to left					

(2) Shock (Drop test)

Unpacked	20 G One time for each face (6 faces) (non-operation)			
Packed	Order of drop	Face to drop is to face the floor. (see the figure)	Height	Number of drop
	1	a, b, c, d, e, g,	35 cm	1 time for each
	2	f	50 cm	



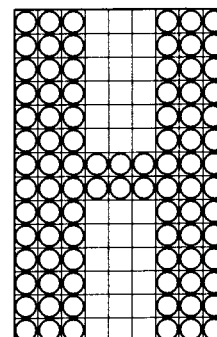
7. REGULATORY STANDARDS

7.1 Safety standards, Applicable standards

UL 1950, Listing
CAS 22.2 No. 950, Products Certification
TüV (IEC-950)/GS (ZH1)
DHHS, 21 CFR subchapter J, X-Ray Radiation
PTB, X-Ray Radiation, Approval
HWC

<EMI test pattern>

White, full "H" characters (9 x 14 dots), block (12 x 24 dots) "H" character font is as follows:



7.2 EMC standards

Designed to meet following standards
VCC I class II
FCC: FCC part 15, subpart B, class-B
VDE 0878/06.83
Vfg 243/1991
CISPR22 class B
MPR- II Radiation

8. COLOR CRT DEFECTIVE STANDARD

8.1 Specification of screen blemishes

This instruction is applied to inspection of the screen faults and of the glass quality of the faceplate.

8.2 Test procedure

8.2.1 Tests are to be done under the following two conditions:

- With the white raster of 34 cd/m² (10 lux) or monochrome raster (component monochromatic raster for causing the white raster to appear) in the center of 9,300K + 27 MPCD image observed at ambient light intensity of about 10 lux during operation.
- A flaw is observed under the light of about 200 lux when the set is not in operation.

8.2.2 Viewing distance should be 60 cm (23.62") minimum. Faults not visible at this viewing distance are permitted.

8.2.3 The Following quality areas are specified:

Zone A: A rectangular area (sides X and Y) Of which the point of intersection. Of the diagonals coincides with the mechanical center of the screen.

	Screen size	
	X	Y
Zone A	366mm (14.4")	275mm (10.8")

Zone B: The remaining screen area except zone A.

8.2.4 Remarks concerning faults:

- Unless otherwise specified, the size of a fault is the smallest value found with one of the two formulas:

$$\frac{a+b}{a} \text{ or } \frac{a}{20} + 2b \text{ (a = length, b = width)}$$

- The dot signal end clogging area defined as not being a chipping in excess of 1/2.

8.3 Permissible limit

8.3.1 Screen faults

(1) Missing phosphor dots

Type of Flaw			Tolerable Quantity		Minimum Distance (mm)
			Zone A	Zone B	
1 trio			1	2	20
2 adjacent dots (same color)			0	1	20
2 adjacent dots (each color)			1	1	20
1 dot	Green phosphor dot		3	2	20
	Yellow phosphor dot		5	4	
	Red phosphor dot		5	4	
Deformation, blemishes, and other faults	Average diameter (mm)	0.51 - 0.75	0	1	20
		0.11 - 0.50	1	1	

8.3.2 Glass faceplate defects

(1) Air bubbles, spot, stains and elongated air bubbles.

Average Diameter (mm)	No. of Allowable Faults			Minimum Distance (mm)
	Zone A	Zone B	A + B	
0.76 -	0	0	0	30
0.51 - 0.75	0	1	1	
0.26 - 0.50	2	3	5	
0.11 - 0.25	—	—	—	Not more than 5 dots must not exist within a diameter of 10mm.

Scratches (Glass and Coating)

Width	Zone A + B	Total of One Product	Minimum Mutual Distance between Flaws
More than 0.16 mm	Must not exist.	—	—
0.11 - 0.15 mm	13 mm long or less	65 mm	33 mm
0.06 - 0.10 mm	26 mm or less	65 mm	17 mm
Less than 0.05 mm	No limit to length	No limit	4 mm

- Other defects not stated above such as chips, cracks, bruises, shear marks, clouds and polished patterns are not allowed when they substantially spoil appearance viewed from the viewing distance.

8.4 AR coating flaw standard

8.4.1 Test procedure

(1) External quality (appearance):

Place a bulb on the inspection bench and throw a white fluorescent light over it. The face glass surface light intensity shall be 1,000 lux to 1,500 lux in this case.

(2) Observing distance:

Observation shall be made at a 40 cm distance. Flaws invisible at this distance should be ignored.

(3) Zone classification:

Zone A: The inner area of a rectangle with horizontal dimension of 320 mm and vertical dimension of 240 mm with the image center taken as its center.

Zone B: The inner area on the fluorescent surface end outside Zone A.

Zone C: The area outside the fluorescent surface end.

(4) Flaw size:

The smaller of the two below shall be taken.

$$\frac{\ell + b}{2}, \frac{\ell}{20} + 2b \quad (\ell = \text{length}, b = \text{width})$$

8.4.2 Flaw criteria

(1) Scratches

Width (mm)	Maximum Allowable length (mm)
< 0.05	Permitted
0.06 - 0.10	26.0
0.11 - 0.15	13.0
> 0.16	Rejected

* A scratch in excess of 0.16 mm in width is taken as a blemish if its contrast is extremely low. The standard given in (2) applies in this case.

(2) Opaque Flaws Such as Stain and Coating Peel-off

Flaws are classified according to the contrast, and judgment is formed based on the size for each contrast. The contract classification is defined as below.

- High contrast:

Foreign matters such as graphite and dirt which obstruct the light from the fluorescent surface, and coating peel-off.

- Medium contrast:

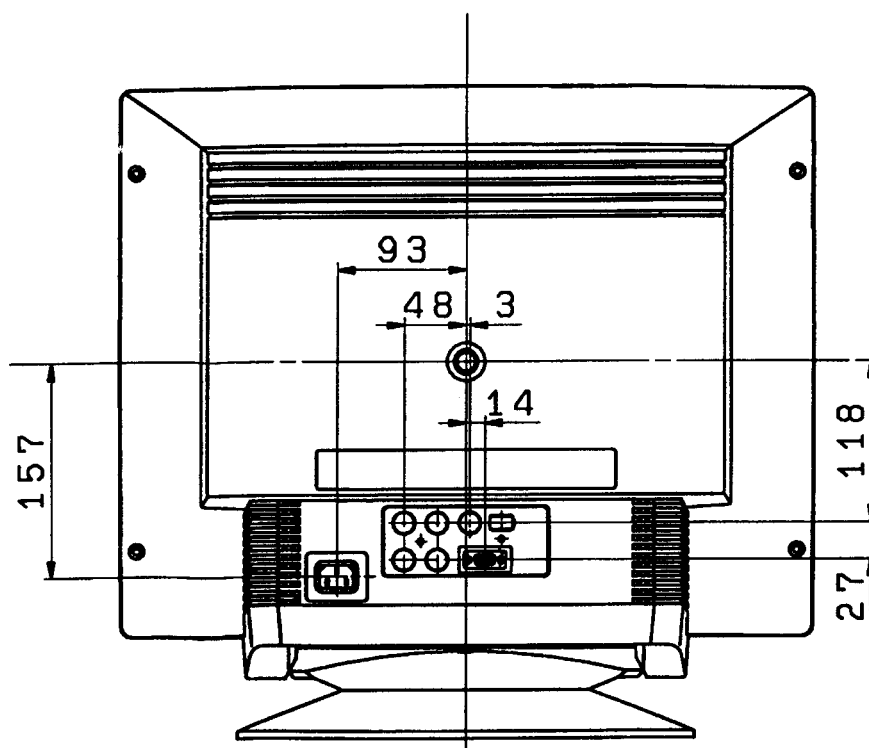
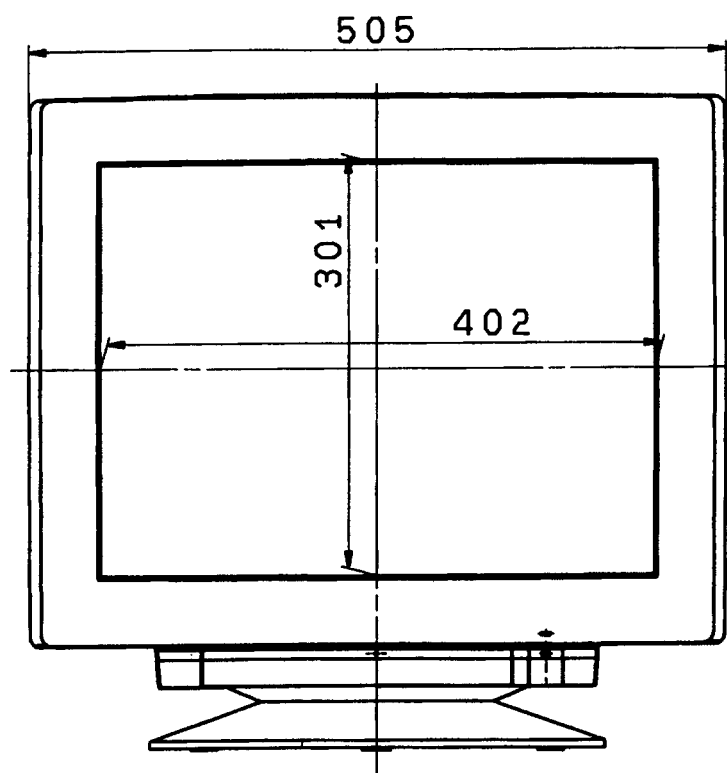
Semi-transparent foreign matters and blemishes.

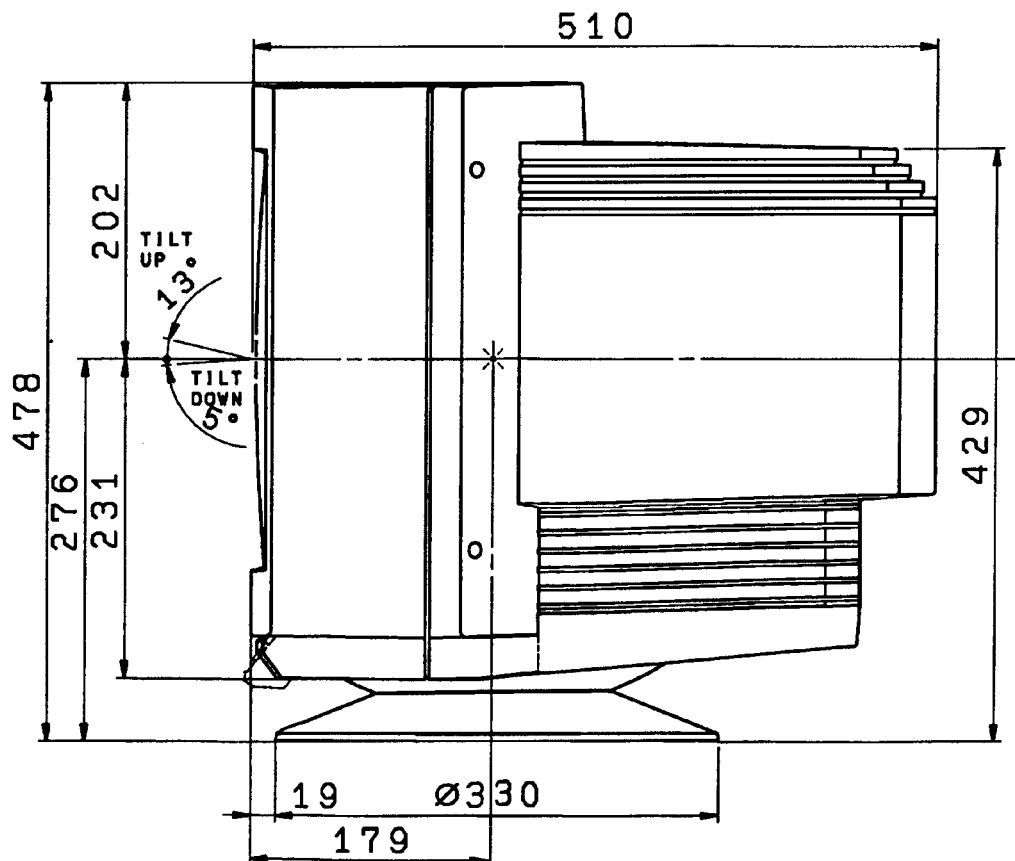
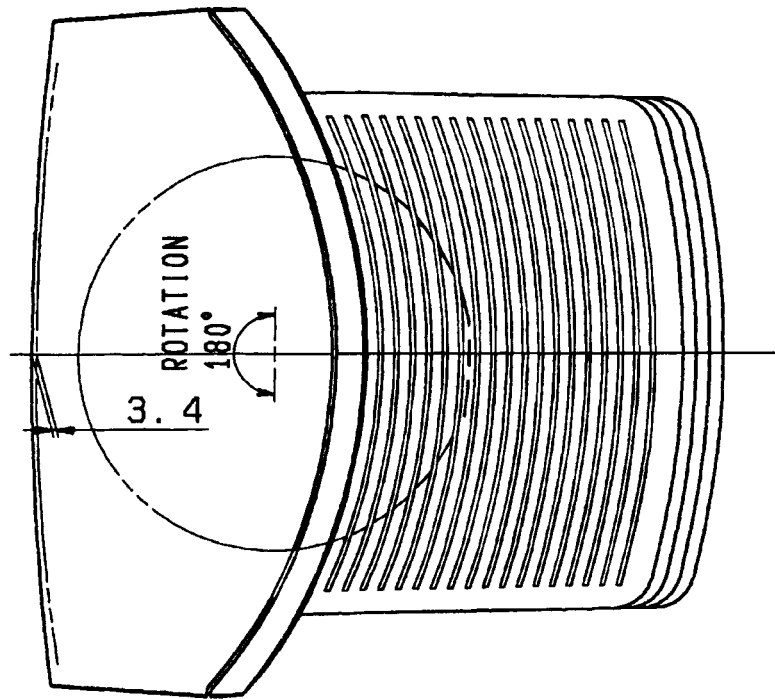
- Low contrast:

The light from the fluorescent surface little differs, but slight blemish and other flaws which cannot be visually identified.

Average Diameter by Contrast (mm)			No. of Tolerable Quantity by Zone		Tolerable Distance (mm)
High Contrast	Medium Contrast	Low Contrast	Zone A	Zone B	
Below 0.10	Below 0.20	Below 0.50	(Judgment is not formed on the basis of quantity, but dots shall be less than five within a circle of 10 mm in diameter.		Blemishes must not be concentrated.
0.11 - 0.25	0.21 - 0.50	0.51 - 2.50	2	4	20
0.26 - 0.50	0.51 - 1.00	1.26 - 2.50	1	2	40
0.51 - 0.75	1.01 - 1.50	2.51 - 3.75	0	1	80

DIMENSIONS



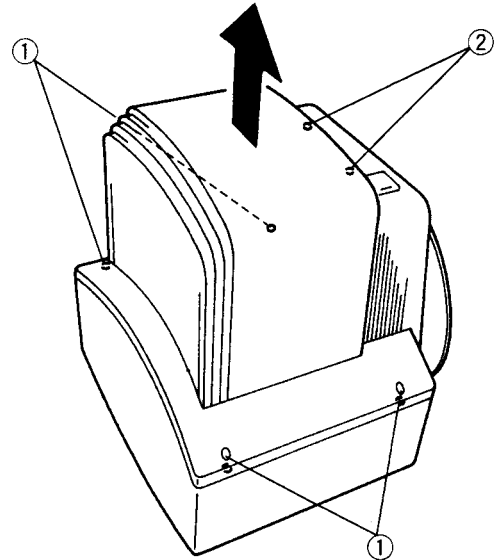
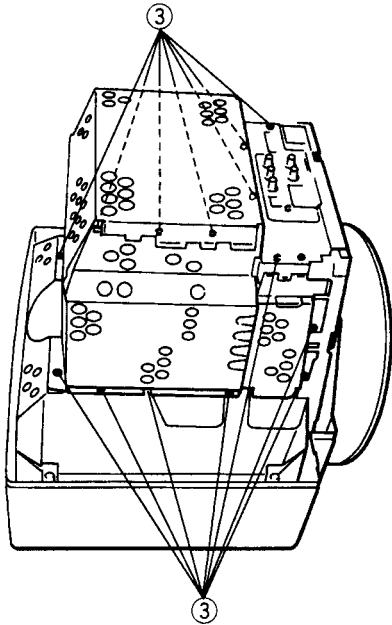


DISASSEMBLY INSTRUCTIONS

1. Rear cover removal

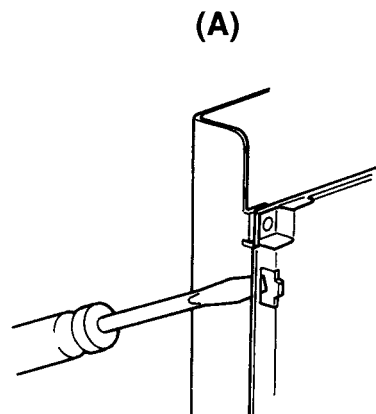
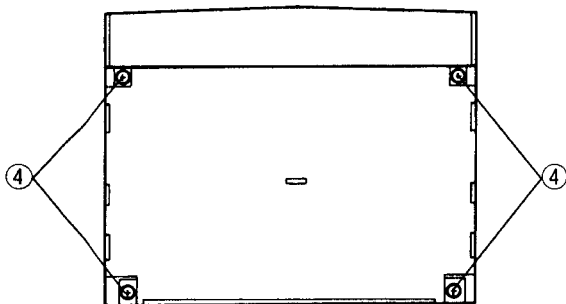
Note: Spread a mat underneath to avoid damaging the CRT surface.

- 1) Remove four large screws ① and two small screws ② from the rear cover.
- 2) Remove the cover.
- 3) Remove 14 screws ③ from the shield case.
- 4) Remove the shield case.

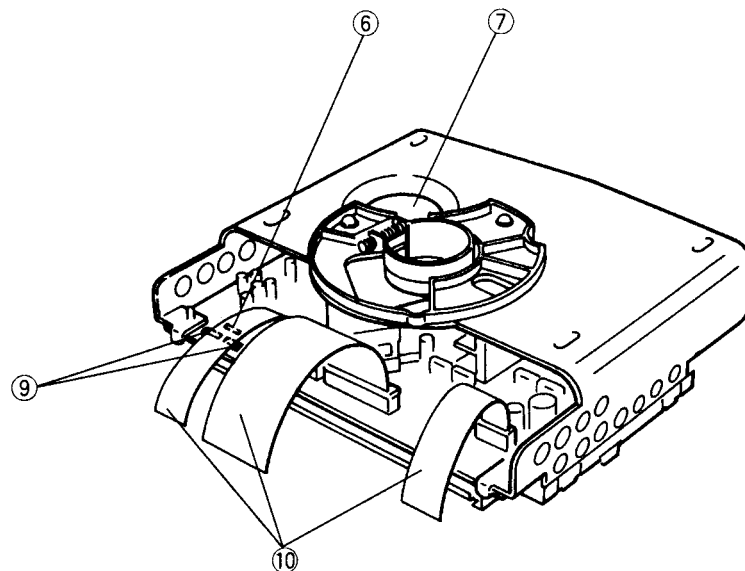
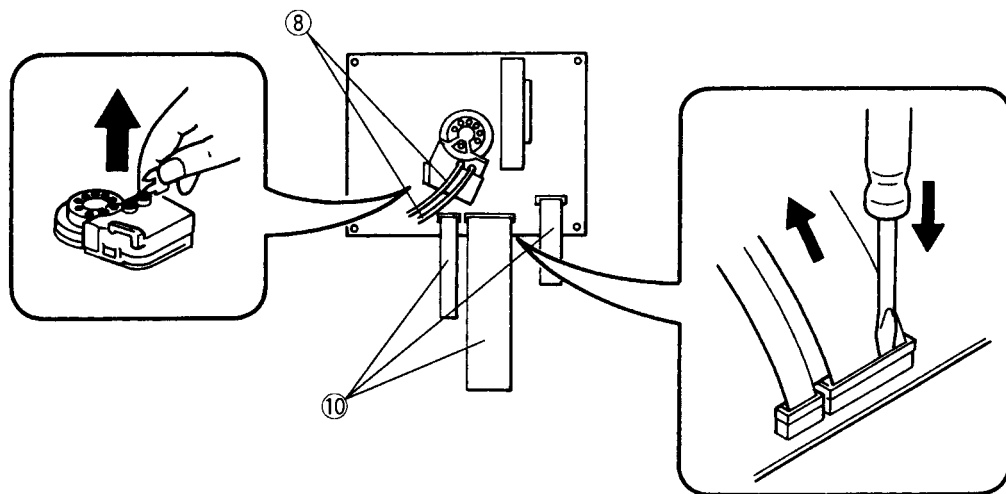
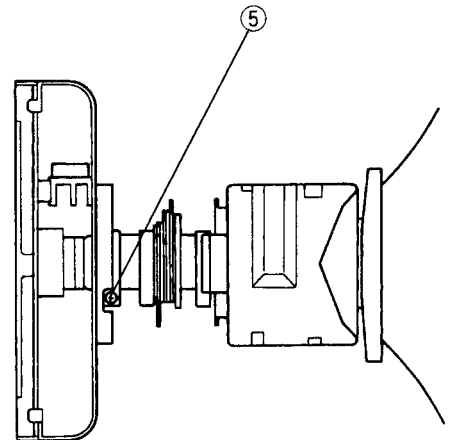


2. Video PCB removal

- 1) Remove four screws ④ securing the shield cover.
- 2) Remove the shield cover (A).

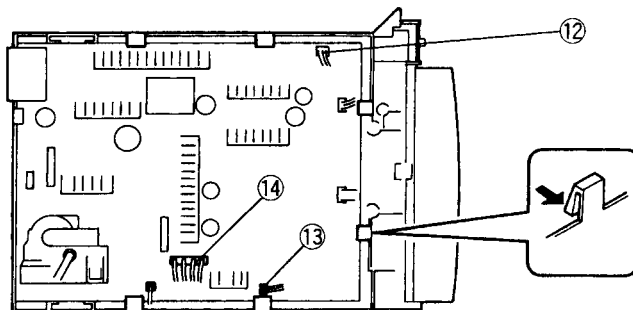
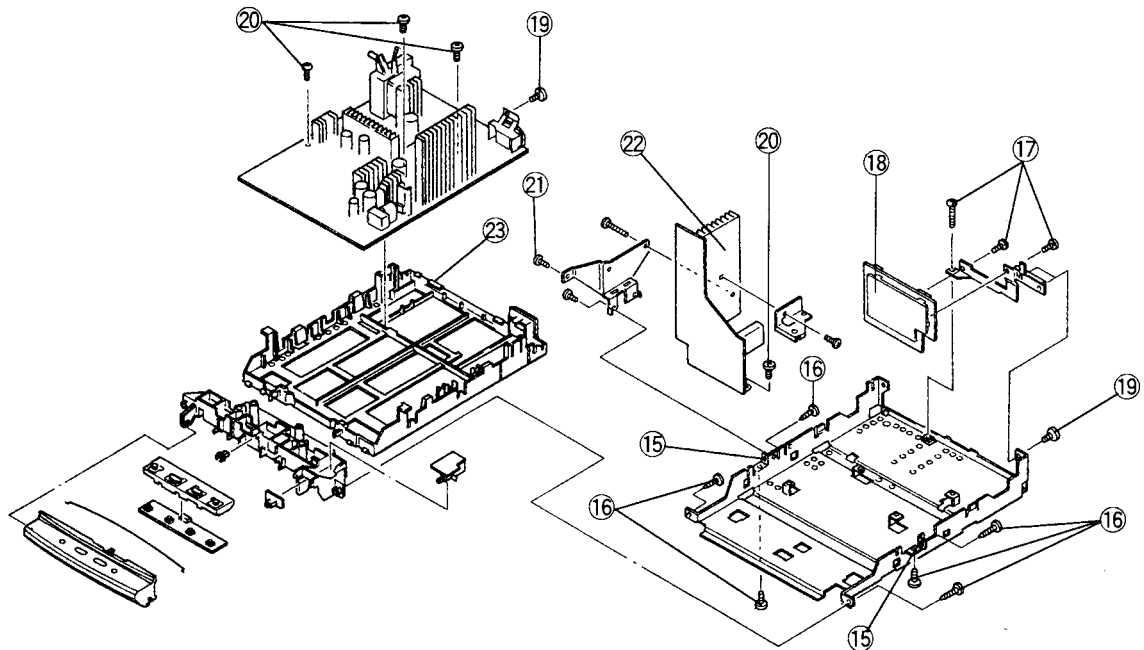
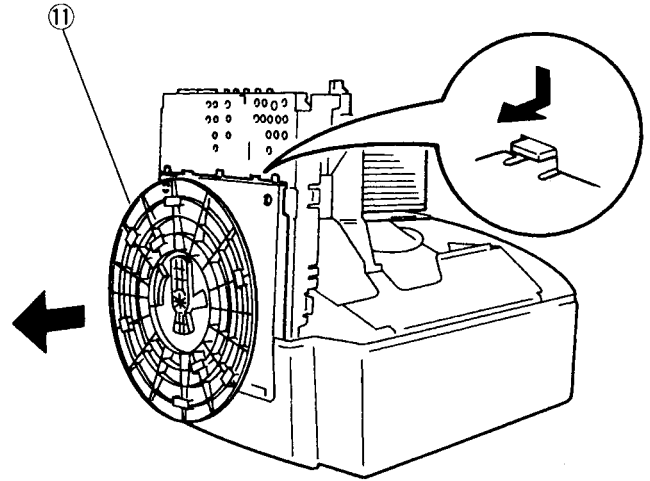


- 3) Loosen the screw ⑤ securing the CRT neck and the shield case.
- 4) Remove the PCB block from the CRT.
- 5) Remove the N10B connector ⑥.
- 6) Remove the N382B connector ⑦.
- 7) Remove two focus leads ⑧ after pulling up the focus lead securing lever.
- 8) Remove two ground connectors ⑨ (N105 and N106) connected to the PCB.
- 9) Remove three flexible PCBs ⑩.
- 10) Remove the PCB from the shield case.



3. Main PCB Removal

- 1) Remove the pedestal ⑪.
- 2) Remove the connector ⑫ (N802) of the degauss coil.
- 3) Remove the connector ⑬ (N101) of the tilt coil.
- 4) Remove the DY connector ⑭.
- 5) Remove the anode cap.
- 6) Remove two ground connectors ⑮.
- 7) Remove six screws ⑯ securing the bottom fitting metal.
- 8) Remove the fitting metal and the PCB from the cabinet.
- 9) Remove three screws ⑰ securing the fitting metal.
- 10) Remove the signal connector PCB ⑱.
- 11) Remove two screws ⑲ securing the AC inlet connector.
- 12) Remove four screws ⑳ securing the fitting metal and PCB.
- 13) Remove one screw ㉑ securing the fitting metal and heat sink.
- 14) Remove the SUB-PCB ㉒.
- 15) Remove the holder ㉓ from the fitting metal and PCB with the figure referenced.



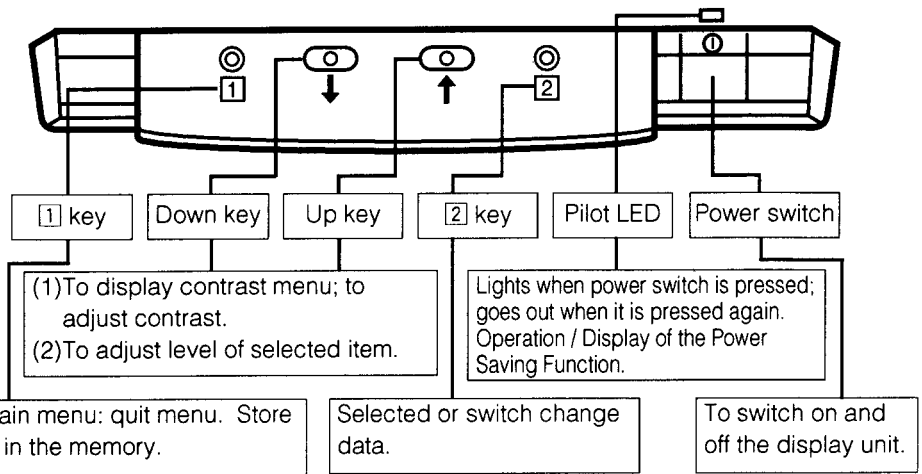
CONTROL LOCATION

Basic operation of parts

Control panel

Names of control

Functions



* For a detailed description of the functions of the [1] key, down key, up key, and [2] key, refer to the next section onward.

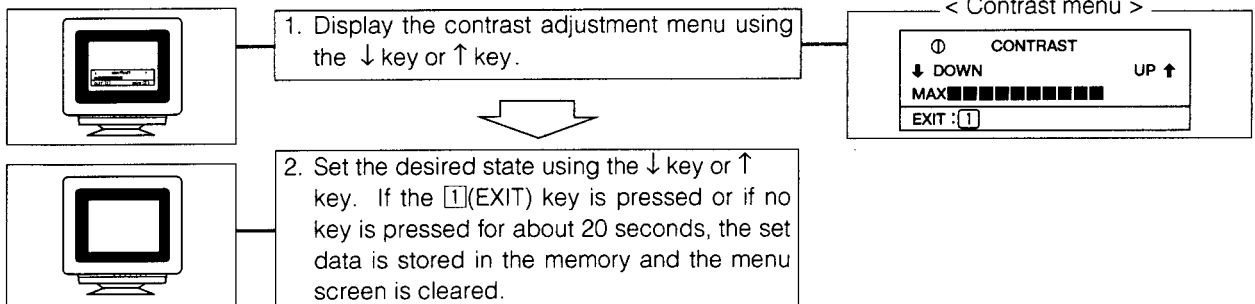
Examples of on-screen operation

A. Contrast adjustment

Display changes

Steps of operation

On-screen display changes

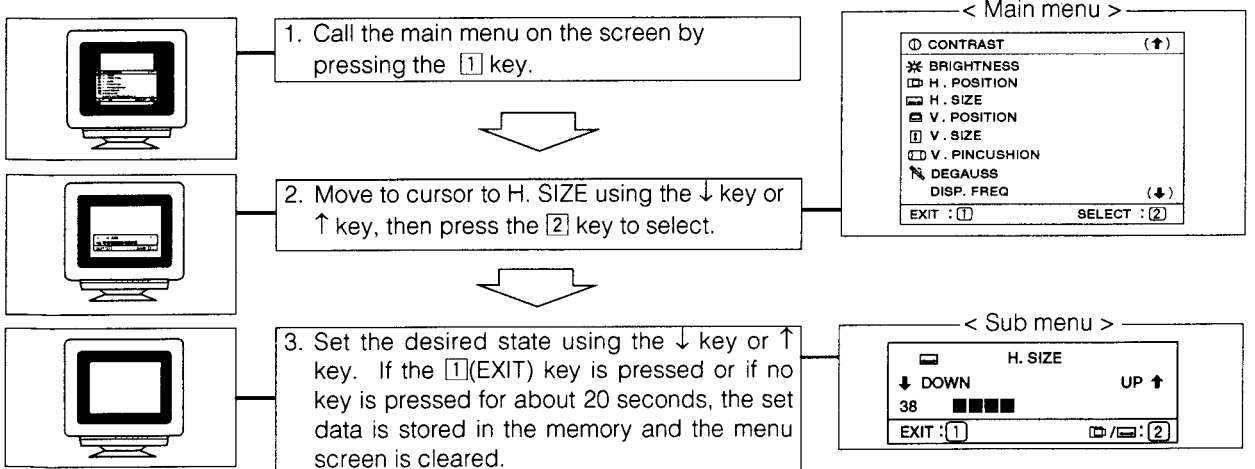


B. H. size adjustment

Display changes

Steps of operation

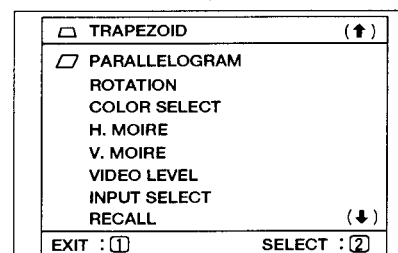
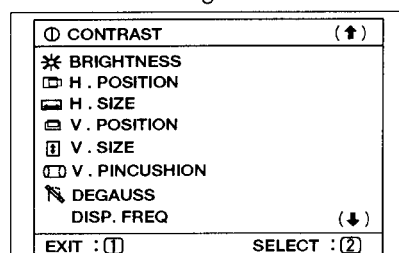
On-screen display changes



Main menu

< Page 1 >

< Page 2 >



CAUTION FOR ADJUSTMENT AND REPAIR

1. Degaussing is inevitably required at purity adjustment or convergence adjustment.
2. If you check or adjust electrical specification or function, more than 20 minutes burn-in is required.
3. Reforming of the lead wire is required after your repair work.
4. Prior to starting work, be sure to check that the input signal is at the specified timing and that the polarity is as specified in all modes.
5. Brightness control: brightness tends to decrease about 5 cd/m² at the white window and about 1 cm/m² in the white raster after mounting the rear cover in position. This should be taken into consideration.
6. Brightness stabilizing time: It takes about 20 to 50 seconds for the brightness to stabilize after turning the power off for 5 seconds (AC). Therefore, care should be taken to this.
7. Aging should be made in white raster of 30 ~ 50 cd/m² and raster size, 402 x 301 mm before adjusting the ITC.
8. Set the CONTRAST to MAX and BRIGHTNESS to CENTER using the O.S.D.

CAUTION FOR SERVICING

When servicing or replacing the CRT, high voltage sometimes remains on the anode. So, completely discharge high voltage before servicing or replacing the CRT so as to prevent a shock to the serviceperson.

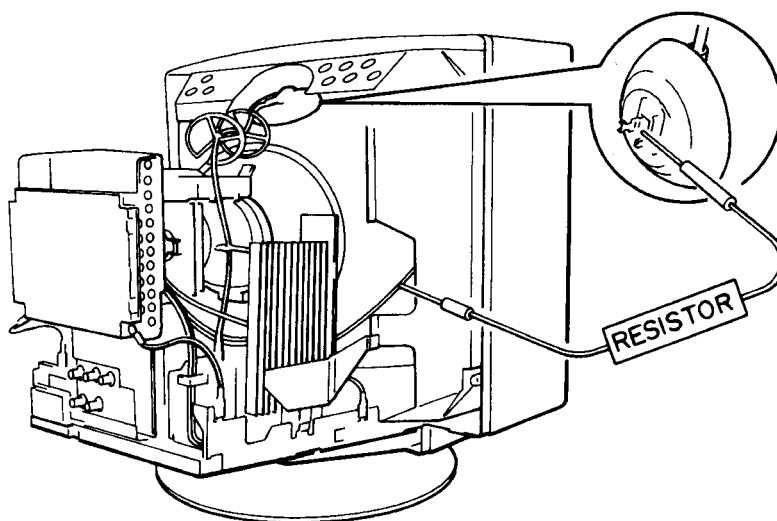
CRT Anode Discharge

1. When you check the CRT anode or replace the CRT, discharge the CRT anode to the external conductive coating (aquadag) of CRT, especially when checked right after power turn-off.
2. Ground one end of a jumper wire which has a resistor (30kV < resisting pressure 100M Ω) and connect the other point to the CRT anode.

Note: *Grounding must be done first.*

This model has a section that does not share a common ground with the power supply section. The different sections are referred to as the HOT section and the COLD section in the precautions below.

1. Do not touch the HOT section and the COLD section at the same time. You may be hit by an electric shock.
2. Do not short the HOT section to the COLD section. This could blow the fuse or damage parts.
3. Never measure the HOT section and the COLD section at the same time when using tools such as oscilloscopes or multimeters.
4. Always unplug the unit before beginning any operation such as removing the chassis.



ADJUSTMENT AND CHECK PROCEDURE

INTRODUCTION

- This monitor is controlled by a microcomputer. With the exception of purity/convergence/focus all is digitally adjusted.
Therefore a computer, the dedicated control software, the dedicated interface, a 9~12V power supply, and a signal generator are required servicing.

TOOL REQUIRED

- Computer**
Control software is compatible with IBM PC.
Therefore, it is suggested to use a computer which has compatibility with IBM PC.
- Control Software**
The HV4 chassis can only use "TX-D2151 adjustment program disk". No other program can access the EEPROM on the monitor. For further information please contact to our monitor sales office.

Interface

Just as in the case of the control software, this interface is a dedicated interface. There are no substitution for this interface. For further information please contact to our monitor sales office.

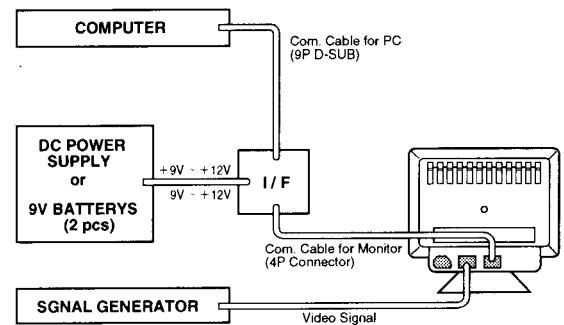
Power Supply

A DC 9~12V (+9~12V/-9~12V) power supply is required for operating the interface.

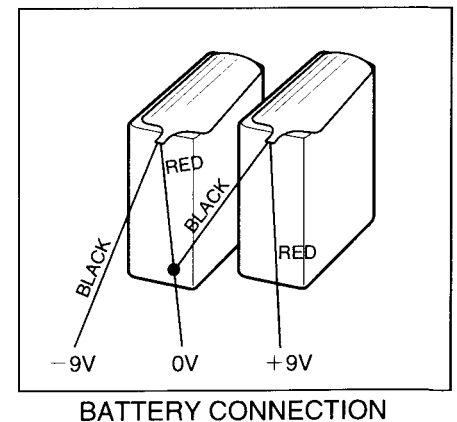
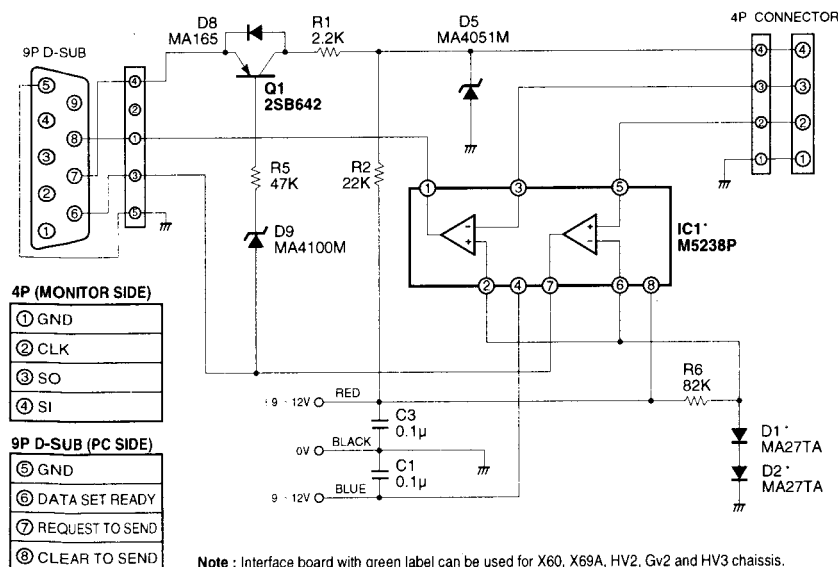
Signal Generator

It is necessary for you to use a signal generator which operates on fH 82 KHz, fv 160 Hz, and fc 135 MHz bands.

INTERFACE CONNECTION



INTERFACE SCHEMATIC DIAGRAM



Parts No.	No. green label	with green label
IC1*	M5223	M5238P
D1*	MA162	MA27TA
D2*	MA162	MA27TA

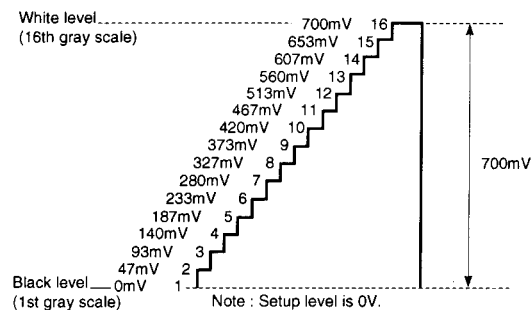
OTHER TOOLS

- Oscilloscope (dual trace)
- Scope probe – Attenuation: 100:1
Attenuation: 10:1
- Digital Voltmeter – Range: 0 to 1000V DC
Accuracy: 0.1%
- TV color Analyzer II – that reads luminance and chromaticity X and Y coordinates.
- Digital High Voltmeter
- AC power supply – Output voltage : 0 to 300V
- Degaussing coil
- Convergence meter
- Scale
- Double-faced scale
- Microscope – Scale factor: 50
- White racquer (Paint)

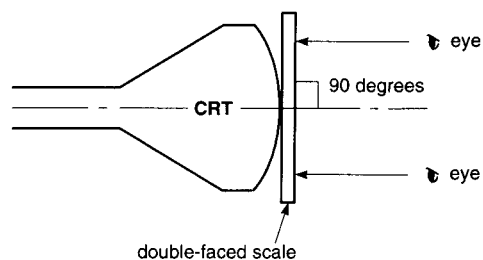
STANDARD CONDITION OF ADJUSTMENT PROCEDURE

- Signal timing : Standard timing 1024 x 768
(See page 5)
- Display pattern : White, full "H" character
- Signal level : V/H: TTL level video: 700mV
- Input source : AC 120V, 60 Hz
- Ambient temperature : Room temperature
- Warm-up time : More than 30 minutes
- Brightness control : Center
- Contrast control : Max.
- Magnetic field : Vertical: 40 μ T
Horizontal: 0 μ T
- Signal cable : Attached

Video input signal from PC.



- Use a Helmholtz device to adjust an unit with no horizontal magnetic field and a vertical field of 40 μ T. Inspect the unit under the same conditions.
- The ambient illuminance must be 200 lux.
- Use an external degaussing coil any time the DEGAUSS switch does not remove color shading.
- To check the image width, height, linearity and distortion, proceed as below.



Measure level with respect to tube axis.

ADJUSTMENT SOFTWARE

1. Software operating procedure

- 1) Power on the computer.
- 2) Connect the Communication cable for monitor adjustment.
- 3) Insert the adjustment disk into the drive.
- 4) At the A:> prompt type "VSR" , then press [ENTER].
- 5) Refer to the adjustment procedures.

2. Adjustment Program

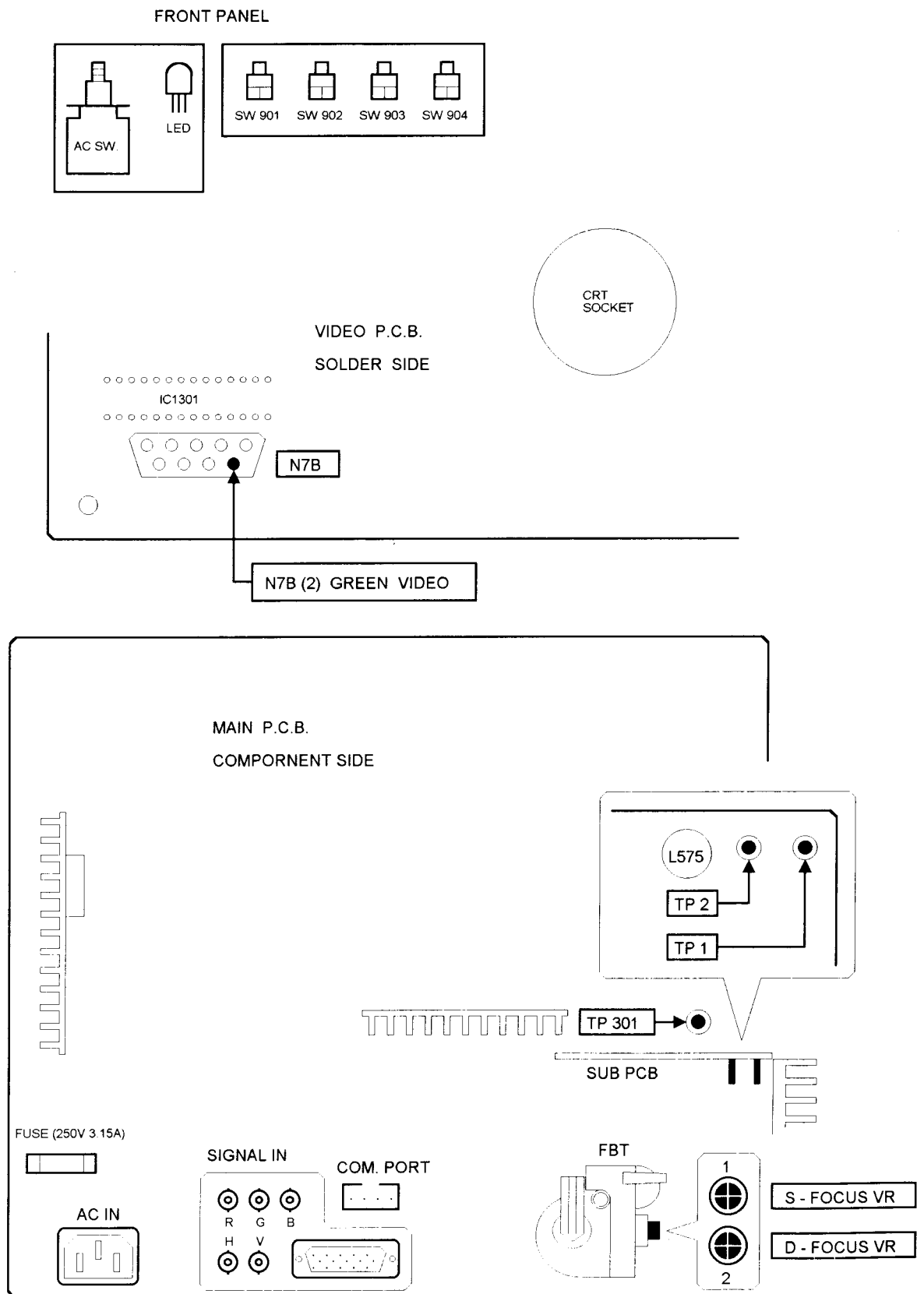
Main Menu of Adjustment Program

<<HV4 ADJUST PROGRAM MAIN MENU>> (e: exit) <Ver *.*>	
1) Load data from FILE	6) Clear User preset
2) Adjust H. OSC freerun	7) Save data to FILE
3) Adjust VSR setting	8) Special ADJUST
4) Adjust OTHER setting	9) Information Service
5) Adjust Factory preset	10) Show Version & Error

Description of Function of Each Menu

- 1) **Load Data from File**
Transfer the contents of the data file of the disk to the monitor and update the contents of EEPROM forcedly.
When the data of the EEPROM is damaged for some reason or other, a return to the initial state can be made easily by using the function from the original data.
- 2) **Adjust H. OSC Freerun**
To guarantee the operation in the follow-up possible horizontal frequencies, the reference oscillation frequency can be automatically set by making the microcomputer reference it.
- 3) **Adjust VSR Setting**
To guarantee the operation in the follow-up possible horizontal frequencies, the reference voltage to be referenced by the microcomputer and the distortion offset reference data should be set.
- 4) **Adjust Other Setting**
This is used to control the brightness and color.
- 5) **Adjust Factory Preset**
Makes the control at the time of preset mode, and the microcomputer is referenced when operating the partial data in modes other than the preset mode.
- 6) **Clear User Preset**
Clear the data written in the user preset domain. Nothing is written in this domain when shipping the product from factory.
- 7) **Save Data to File**
Transfer the data of the EEPROM of the monitor to a data file in a desired file name.
- 8) **Information Service**
Displays the H/V frequencies of the signal fed to the monitor, and the operation status on the monitor of the PC side.
- 9) **Show Version and Error**
 - ① Return the microcomputer version to the PC.
 - ② If there is an error in monitor operation, the contents of that error are returned to the PC.

SERVICE ADJUSTMENT CONTROL LOCATION



REQUIRED ADJUSTMENT PROCEDURE AFTER A PARTS IS REPLACED (✓ IS REQUIRED)

ADJUSTMENT ITEM		REPLACED PARTS															
		MAIN P.C.B.	VIDEO P.C.B.	CRT DY	IC1301 IC1302 IC1303 Q1075 Q1175 Q1275 IC1385	Q1001 Q1004 Q1005 Q1101 Q1104 Q1105 Q1201 Q1204 Q1205	IC330 IC351 Q295 Q330	IC470 IC490 Q484 Q494 Q495	IC501 IC503	IC461 IC476 Q470 Q472	IC301 IC302 Q301 Q302 Q304 Q305 Q306 Q307 Q319	IC550 IC580 IC581 Q549 Q550 Q717 Q719	Q850 Q851 Q852 Q853 Q854 Q853	IC581 Q581 Q582 Q583 Q584 Q585	IC635 IC660 Q644 Q672 Q673 Q674	Q675 Q676 Q680 Q690	IC902
(A)	DATA SETTING *	✓															✓
(B)	H. FREE RUN	✓						✓									✓
(C)	H. DRIVE DUTY	✓										✓	✓		✓	✓	✓
(D)	H. DRIVE +B	✓										✓	✓		✓	✓	✓
(DA)	EHT	✓		✓								✓	✓		✓	✓	✓
(E)	DAF	✓									✓						✓
(F)	FOCUS	✓		✓							✓						✓
(G)	H. CENTER	✓		✓										✓	✓	✓	✓
(H)	H.V. SIZE / POSI V.PCC (1)	✓		✓				✓	✓	✓		✓	✓		✓	✓	✓
(I)	V.PCC	✓		✓								✓	✓				✓
(J)	V. LIN (C)	✓		✓				✓		✓							✓
(K)	H.V. SIZE / POSI V.PCC (2)	✓		✓				✓	✓	✓		✓	✓		✓	✓	✓
(L)	H.V. SIZE / POSI V.PCC (3)	✓		✓				✓	✓	✓		✓	✓		✓	✓	✓
(M)	BRIGHTNESS, COLOR	✓	✓	✓	✓	✓	✓								✓	✓	✓
(N)	ABL	✓	✓	✓	✓	✓	✓								✓	✓	✓
(P)	INPUT 1.0V SETTING	✓	✓	✓	✓	✓	✓										✓
(Q)	H. SIZE LIMITER SETTING	✓		✓					✓			✓	✓		✓	✓	✓
(R)	FINAL SETTING	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(T)	DATA SAVING																
	PURITY & CONVERGENCE			✓													
	SCREEN CHECK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* (A) DATA SETTING : Do not load standard data except when main P.C.B. and IC902(EEPROM) are replaced.

ADJUSTMENT PROCEDURE











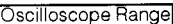





1. Description of Adjustment Method


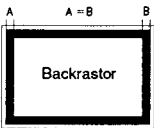


























Item Program Menu		◇ Test Meter ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
A	DATA SETTING		A1	OFF	Turn the power on, but do not connect the signal cable.	
	1) Load data from FILE		A2		Press by setting the cell to the menu at left.	
			A3		A message FILE -> EEPROM FILE NAME (q or Q escape) []: is displayed. So, key in the DACDATA.DAT (when using the standard data) and press .	
			A4		Note: To make the transferred data effective, turn the power of the monitor off once and turn it on once again.	
Do not load standard data except when main P.C.B. and IC902 (EEPROM) are replaced.						
B	H. FREE RUN		B1		Press by setting the cell to the menu shown at left.	
	2) Adjust H. OSC freerun	□ Crosshatch	B2		Set the cell to the adjusting mode <u>INTP[0]</u> and press .	
			B3	HV4S-1	Check to be sure that the input signal to the monitor set is [fH 29.5kHz] and [fV 48.0Hz] and press .	 ↓ (Automatic adjustment)
			B4		When the screen image has stabilized, press <u>E</u> and return the image to the screen image of B2. <The same as B2, B3, and B4 except for the adjusting mode/signal.>	
			B5	HV4S-2	Adjusting mode <u>INTP[1]</u> : Input signal [fH 39.0kHz] [fV 77.1Hz]	
			B6	HV4S-4	Adjusting mode <u>INTP[2]</u> : Input signal [fH 64.5kHz] [fV 105.0Hz]	
			B7	HV4S-5	Adjusting mode <u>INTP[3]</u> : Input signal [fH 82.5kHz] [fV 165.0Hz]	
			BE		Press <u>E</u> to return to the main menu.	
C	H. DRIVE DUTY	◇ Oscilloscope ▼ TP2 - GND □ Crosshatch	C1		Set the cell to the menu at left and press .	
	3) Adjust VSR setting	<u>Oscilloscope Range</u> HV4-1 10 μs/div HV4-2 5 μs/div HV4-4 5 μs/div HV4-5 2 μs/div	C2		Set the cell to the adjusting mode <u>INTP[0]</u> and press .	
			C3	HV4S-1	Check to be sure that the input signal to the monitor set is at given at left [fH 29.5kHz] and [fV 48.0Hz] and press .	
			C4		Set the cell to <u>H_DRIVE DUTY</u> and press .	
			C5		Then move the cell to the data side. Make the adjustment to match the value shown at the right using and keys. Make registration using after adjustment and press <u>E</u> to return to the menu of C2. <The same as C2, C3 C4, and C5 after setting the adjusting mode/signal and adjustment.>	t1/t2 x 100 = 53% ±2.5%
			C6	HV4S-2	Adjusting mode <u>INTP[1]</u> : Input signal [fH 39.0kHz] [fV 77.0Hz]	51% ±2.5%
			C7	HV4S-4	Adjusting mode <u>INTP[2]</u> : Input signal [fH 64.5kHz] [fV 105.0Hz]	47%±2.5%
			C8	HV4S-5	Adjusting mode <u>INTP[3]</u> : Input signal [fH 82.5kHz] [fV 165.0Hz]	45% ±2.5%
			CE		Press <u>E</u> to return to the main menu.	




















Note 1: Check to be sure that the program disc name is TX-D2151 before making necessary adjustment.




















Note 2: Unless otherwise specified, the monitor state is as given at right.

Note 3: The underlined places indicate the adjustment items on the screen of the PC.

Item Program Menu	◇ Test Meter ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
D	H. DRIVE+B	◇ Digital voltmeter ▼ TP1-GND	D1	Set the cell to the menu at left and press  .	
			D2	Set the cell to the adjusting mode <u>INTP[0]</u> and press  .	
			D3	HV4S-1	20V ±0.15V
			D4		
			D5		
	3) Adjust VSR setting		D6	HV4S-2	18V ±0.15V
			D7	HV4S-4	15V ±0.15V
			D8	HV4S-5	12V ±0.15V
			DE	Press  to return to the main menu.	
E	EHT ADJUST	◇ High voltage probe and digital voltmeter □ RGB OFF (Sync signal only)	E1	MODE-2	27KV ±0.3KV
			E2	Turn the power switch of the monitor OFF.	
			E3	Connect high voltage probe to anode cap and GND, then	
	4) Adjust OTHER setting		E4	Turn the power switch of the monitor ON.	
			E5	Set the cell to the menu at left and press  .	
			E6	Check to be sure that the input signal is as shown at left.	
			EE	Move the cell to <u>EHT</u> and press  .	
F	DAF	◇ Oscilloscope ◇ 100:1 probe ◇ 10:1 probe	F1	Set the cell to the menu at left and press  .	Waveform of E4 (H. DAF)
			F2	Select the <u>2:DAF ADJUST</u> using  .	
	8) Special ADJUST	▼ TP301 - GND (100:1)	F3	HV4S-5	
		▼ N7B2(G. IN) - GND	F4		
		□ White flat field pattern	F5	Check to be sure that the signal is as shown at left.	Waveform of E6 (V. DAF)
			F6	Adjust the time axis of the oscilloscope so that the DAF waveform becomes as shown at right.	
			F7	Move the cell to <u>H. DAF GAIN</u> , <u>H. DAF POS</u> and adjust as shown at right using  and  . (444Vp-p ±10V)	
			FE	Adjust the time axis of the oscilloscope so that the DAF waveform becomes as shown at right.	
G				Move the cell to the <u>V. DAF GAIN</u> , <u>V. DAF POS</u> and adjust as shown at right using  and  . (180Vp-p ±10V)	
		H-DAF 2 μs/div V-DAF 5 μs/div		Return to the menu of F2 using  and return to the main menu using  .	
	FOCUS	□ Crosshatch	G1	MODE-2	
			G2	Turn the D FOCUS VR of the FBT to make the focus of the corner section optimum.	
			G3	Turn the S FOCUS VR of the FBT to make the focus of the center section optimum. (Repeat G1 and G2 to make it optimum.) Switch to the character pattern and check to be sure that the focus is at its best. (Note: This adjustment should be done by turning the VR using a screwdriver.)	

Item Program Menu		<input type="checkbox"/> Test Meter <input checked="" type="checkbox"/> Test Point <input type="checkbox"/> Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
H	H. CENTER 3) Adjust VSR setting	<input type="checkbox"/> RGB OFF (Sync signal only)	H1	HV4S-1	Set the cell to the menu at left and press  .	 Set the RASTER to the center with respect to the bezel.
			H2		Then set the Brightness to the max. Set the cell to the adjusting mode <u>INTP[0]</u> and press  .	
			H3		Check to be sure that the input signal to the monitor set is as shown at left [fH 29.5kHz] and [fV 48.0Hz] and press  .	
			H4		Set the cell to the <u>H_CENTER</u> and press  , and move the cell to the data side.	
			H5		Make adjustment as shown at right using  and  . Register using  after adjustment, press  , and return to the menu of H2. <The same as H2, H3, H4, and H5 except for the adjusting mode and signal.>	
			H6	HV4S-2	Adjusting mode <u>INTP[1]</u> : Input signal [fH 39.0kHz] [fV 77.1Hz]	
			H7	HV4S-4	Adjusting mode <u>INTP[2]</u> : Input signal [fH 64.5kHz] [fV 105.0Hz]	
			H8	HV4S-5	Adjusting mode <u>INTP[3]</u> : Input signal [fH 82.5kHz] [fV 165.0Hz]	
			HE		Return to the main menu by pressing  .	
I	HV. SIZE/HV. POSI/ V. PCC (1) 5) Adjust Factory preset	<input type="checkbox"/> Crosshatch	I1	MODE-2	Set the cell to the menu at left and press  .	H. SIZE 380mm ±5mm V. SIZE 285mm ±5mm HV. POSI CENTER
			I2		Check to be sure that the input signal is as shown at left and press  .	
			I3		<Set the cell to the following items, press  , and make I3 and I4.> Adjust the <u>H. SIZE</u> , <u>V. SIZE</u> , <u>H. POSI</u> and <u>V. POSI</u> to the left using  and  .	
			I4		Set the <u>V. PCC</u> , <u>V. PCC TRAPEZOID</u> and <u>V. PCC PARAL-LEL</u> to the best using  and  .	
			IE		Press  and  to return to the main menu.	
J	V. PCC 3 Adjust OTHER setting	<input type="checkbox"/> Crosshatch	J1	MODE-2	Check to be sure that the input signal is as shown at left. Set the cell to the menu at left and press  .	
			J2		<Set the cell to the following items, press  , and make necessary adjustment.> Set the <u>V. PCC CORNER</u> , <u>V. PCC CENTER</u> and <u>V. PCC BALANCE</u> to the best using  and  .	
			JE		Press  to return to the main menu.	
K	V. LIN (C) 8) Special ADJUST	Crosshatch	K1	MODE-2	Set the cell to the menu at left and press the	
			K2		Select the <u>4. V.LIN(C)</u> from the menu.	
			K3		Check to be sure that the input signal is as show at left.	
			K4		Adjust the V. LIN to the best using  and  .	
			KE		Return to the menu of K2 using  and return to the main menu using  .	

Item Program Menu		<input type="checkbox"/> Test Meter <input checked="" type="checkbox"/> Test Point <input type="checkbox"/> Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
L	HV. SIZE, HV. POSI, V. PCC (2) 3) Adjust VSR setting	<input type="checkbox"/> Crosshatch	L1		Set the cell to the menu at left and press  .	H. SIZE 380mm ±5mm V. SIZE 285mm ±5mm HV. POSI CENTER V. PCC best point
			L2		Set the cell to the adjusting mode <u>INTP[0]</u> and press  .	
			L3	HV4S-1	Check to be sure that the input signal to the monitor set is as shown at left [fH 29.5kHz] and [fV 48.0Hz] and press  .	
			L4		Set the cell to the following items, press  , and make necessary adjustment using the  and  .	
			L5		① <u>H. SIZE</u> , ② <u>V. SIZE</u> , ③ <u>H. POSI</u> , ④ <u>V. POSI</u> , and ⑤ <u>V. PCC</u> After adjusting ① - ⑤, press  and return to the menu of L2. <Same as L2, L3, L4, and L5 except for the adjusting mode/signal.>	
			L6	HV4S-2	Adjusting mode <u>INTP[1]</u> : Input signal [fH 39.0kHz] [fV 77.1Hz]	
			L7	HV4S-4	Adjusting mode <u>INTP[2]</u> : Input signal [fH 64.5kHz] [fV 105.0Hz]	
			L8	HV4S-5	Adjusting mode <u>INTP[3]</u> : Input signal [fH 82.5kHz] [fV 165.0Hz]	
			LE		Press  to return to the main menu.	
M	HV. SIZE, HV. POSI, V. PCC (3) 5) Adjust Factory preset	<input type="checkbox"/> Crosshatch	M1		Set the cell to the menu at left and press  .	MODE 1, 2 H. SIZE 380mm ±5mm V. SIZE 285mm ±5mm HV. POSI CENTER V. PCC best point MODE 3 H. SIZE 355mm ±5mm V. SIZE 284mm ±5mm
			M2	MODE-1	Check to be sure that the input signal to the monitor set is as shown at left [fH 31.5kHz] and [fV 60Hz] and press  .	
			M3		Set the cell to the following items, press  , and make adjustment as shown at right using  and  .	
					① <u>H. SIZE</u> , ② <u>V. SIZE</u> , ③ <u>H. POSI</u> , ④ <u>V. POSI</u> , ⑤ <u>V. PCC</u> , ⑥ <u>PARALLEL</u> and ⑦ <u>TRAPEZOID</u> Note: H. POSI and V. SIZE should use both modes, MSB and LSB.	
			M4		After adjusting ① - ⑦, go to M5 using  and  .	
					<Same as M2, M3, and M4 except for the input signal below.>	
			M5	MODE-2	Input signal [fH 60.0kHz] [fV 75.01Hz]	
			M6		After adjustment, go to M7 using  and  .	
			M7	MODE-3	Input signal [fH 79.9kHz] [fV 75.0Hz]	
			ME		Return to the main menu after adjustment using  and  .	

Item Program Menu		◇ Test Meter ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
N	BRIGHTNESS, COLOR		N1		Set the CONTRAST...MAX, BRIGHTNESS...CENTER and COLOR...9300K using the OSD.	
	4) Adjust OTHER setting		N2		Set the cell to the menu at left and press  .	
		<input type="checkbox"/> Sync signal only (RGB OFF)	N3	MODE-2	Feed the signal at left/pattern to the monitor.	
			N4		Set the cell to the R. LOW LIGHT 9300K then press  , and move the cell to data side.	
			N5		Set the data value to "35" using  and  .	
			N6		Do the same as N4 and M5 for G. LOW LIGHT 9300K.	
			N7		Do the same as N4 and M5 for B. LOW LIGHT 9300K.	
			N8		Move the cell to G2 9300K then press  , set the data value to "65".	
			N9		Press  until raster appear with any one of three colors.	
			N10		Move to LOW LIGHT 9300K of above color then set the value to "FF".	
			N11		Do the same for N9, N10 for another colors.	
			N12		Move the cell to G2 9300K of the rest of three colors and adjust until raster appear slightly.	
			N13		Adjust LOW LIGHT 9300K of above two colors (N9~N11) to the same as the N12.	
			N14		Adjust G2 9300K to the point where raster disappear.	
		<input type="checkbox"/> 16 gradation grayscale	N15		Switch over to the pattern at left and check to be sure that the 2nd gradation vaguely glitters.	
		<input type="checkbox"/> White window pattern (60 x 60mm)	N16		Switch over to the pattern at left and bring the sensor of the analyzer to the center of the screen image and set the CONTRAST...MAX.	
		◇ TV COLOR ANALYZER II	N17		Move the cell to the following items and make adjustment as shown at right using  and  . R. SUBCONT 9300K, G. SUBCONT 9300K and B. SUBCONT 9300K	Y=110 cd/m ² ±5 x=0.281 ±0.020 y=0.311 ±0.020
			N18		Make adjustment to as shown at right using <u>CONTRAST</u> (Program menu on the PC)	Y=3 cd/m ² x=0.281 ±0.020 y=0.311 ±0.020
			N19		Move the cell to the following item. Then make adjust as shown at right. R. LOW LIGHT 9300K, G. LOW LIGHT 9300K and B. LOW LIGHT 9300K	
			N20		Change the following data value to the same as 9300K using  and  . G2 6550K, R. SUBCONT 6550K, G. SUBCONT 6550K and B. SUBCONT 6550K R. LOW LIGHT 6550K, G. LOW LIGHT 6550K and B. LOW LIGHT 6550K	
	8) Special ADJUST		N21		Press  to return to the main menu.	
			N22		Set the cell (Special ADJUST) to the menu at left and press  .	
			N23		Select 3: Color ADJUST from the menu.	
			N24		Automatically convert for the 6550K data when press  .	
			NE		Press  to return to M22 menu then press  to return to main menu.	
O	ABL	<input type="checkbox"/> WHITE FLAT FIELD PATTERN	O1		Set the CONTRAST...MAX, BRIGHTNESS...MAX, COLOR...9300K using the OSD of the monitor.	
		◇ TV COLOR ANALYZER II	O2		Set the cell to the menu at left and press  .	
	4) Adjust OTHER setting		O3	MODE-2	Feed the signal at left and bring the sensor of the analyzer to the screen image center.	
			O4		Move the cell to <u>ABL 9300K</u> and adjust as shown at right.	Y=100 cd/m ² ±10
			O5		Change the ABL 6550K data values the same as ABL 9300K using  and  .	
			OE		Press  to return to the main menu.	

Item Program Menu		<input type="checkbox"/> Test Meter <input type="checkbox"/> Test Point <input type="checkbox"/> Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
P	INPUT 1.0V SETTING	<input type="checkbox"/> White flat field pattern	P1	MODE-2	Set the cell to the menu at left and press <input type="button" value="↵"/> . Select 1: VIDEO 1.0V ADJUST from the menu. Set the <u>CONTRAST MAX</u> and <u>VIDEO INPUT 1.0V</u> using the OSD of the monitor set. Press <input type="button" value="↵"/> against the message of "hit return key". Press <input type="button" value="↵"/> as other message is displayed. Press <input type="button" value="E"/> to return to the menu of P2 and return to the main menu using the <input type="button" value="E"/> .	
	8) Special ADJUST		P2			
			P3			
			P4			
			P5			
			PE			
Q	H. SIZE LIMITER		Q1	MODE-2	Set the cell to the menu item at the left and press <input type="button" value="↵"/> . Check to be sure that the input signal is as show at left. Select the 5: H. SIZE LIMITER from the menu. Automatically set with selected this menu. Return to the menu of Q3 using <input type="button" value="↵"/> and return to the main menu using <input type="button" value="E"/> .	
	8) Special ADJUST		Q2			
			Q3			
			Q4			
			QE			
R	FINAL SETTING		R1	MODE-2	Set the cell to the menu at left and press <input type="button" value="↵"/> . Select the 9: FINAL TUNE from the menu. Press either Y or N when the message of "CANCEL USER PRESET DATA (y/n) ->" has been output after a while. Press <input type="button" value="↵"/> to return to the menu of R2 and then return to the main menu using <input type="button" value="E"/> .	
	8) Special ADJUST		R2			
			R3			
			RE			
S	DATA SAVING		S1		Set the cell to the menu at left and press <input type="button" value="↵"/> . Key in the file name after []:. Use SERIAL No. as a file name. (EXAMPLE : FF4111732 = "4111732. DAT")	
	7) Save data to FILE		S2			

2. Purity adjustment

The CRT is an ITC assembly, however, here is the explanation for readjustment just in case.

If color shading is apparent, make the following adjustment.

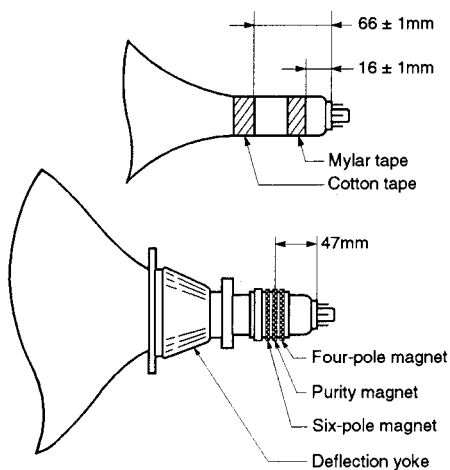
2.1.

- (1) Verify that no unusual magnetic fields are near the Display unit (magnetic screwdrivers, table magnets, etc.). If possible, use a wooden workbench for this procedure.
- (2) Degauss the magnetism of chassis and CRT with external degaussing coil.
- (3) Adjust the purity magnet until each of the red, green and blue channels is free of color shading.

Make the following adjustment if color shading cannot be corrected by the above, or if the CRT or deflection yoke has been replaced.

2.2.

- (1) Keep the convergence yoke and deflection yoke in the positions shown below.

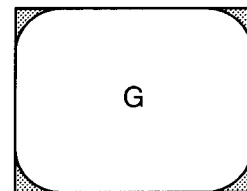


CY tightening torque: 8^{+2}_{-1} kgf-cm

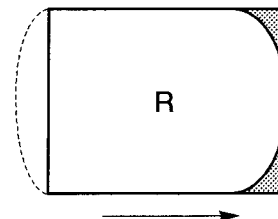
DY tightening torque: 18 ± 2 kgf-cm

- (2) Make sure that this adjustment is done later than 30 minutes after power on.
- (3) Degauss the magnetism of chassis and CRT with an external degaussing coil.
- (4) Verify that static convergence is roughly matched. If it is misaligned, adjust static convergence of Red color and Blue color with Four-pole magnet.

- (5) Remove the wedge from the deflection yoke, and pull the deflection yoke fully to the front.
- (6) Display green color solely with the signal generator. Adjust the purity magnet so that the center of the screen displays a pure green disk. Slide the deflection yoke rearward until the four corners shaded and check its area's uniformity.



- (7) After the adjustment of step 5, readjust the static convergence if some gap was found. Static convergence alignment for this step is to be performed with Four-pole magnet and Six-pole magnet.
- (8) Display red disk. Adjust the purity magnets so that red disk is as the center of the screen simultaneously. If red is shifted, move its position in the opposite direction.



- (9) Display Green again. Slide the deflection yoke rearward until the screen appears green on the whole, and fasten it there.
- (10) Confirm purity in each direction by rotating the set to direction of East, West, South, and North after degauss by external degaussing coil.
- (11) If magnetism remains even after the adjustment, use the compensation magnet to obtain purity.

The final confirmation method for purity

In the natural magnetic field, rotate the monitor in the direction of East, West, South and North.

Earth's magnetic field may cause magnetism on the monitor. Confirm that the automatic degaussing circuit built in the monitor can erase the amount of magnetism which was introduced with above rotation.

3. Convergence adjustment

The CRT is an ITC assembly, however, here is the explanation for readjustment just in case.

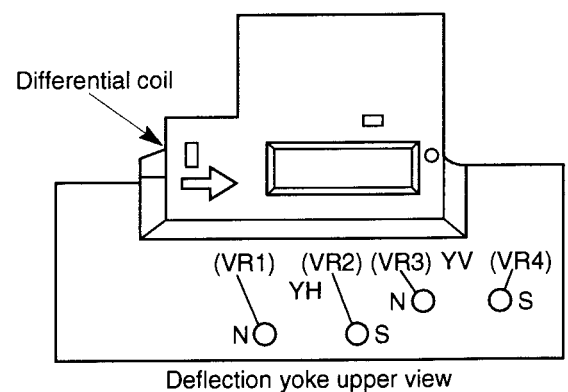
- (1) Make sure that this adjustment is done later than 30 minutes after power on. Check general ability coarse adjustment and purity adjustment finished.
- (2) Degauss the magnetism of chassis and CRT with degaussing coil. (CRT board also)
- (3) Apply mixed crosshatch signals of red and blue from the signal generator. Nudge the deflection yoke to equal its inclination up and down, right and left with a temporary wedge between CRT and the top of the yoke.
- (4) Match the red and blue images at the center of the screen by rotating the Four-pole magnet (See STEP-1 in figure for examples).
- (5) Apply mixed crosshatch signal of red, blue and green from the signal generator.
- (6) Match the red, green and blue images at the center of the screen by rotating the Six-pole magnet. (See STEP-2 in figure for examples)
- (7) Loosen the deflection yoke fastening screw and gently nudge the yoke up and down to achieve the best overall convergence on the edges of the screen (See STEP-3 in figure for examples).
Insert wedge at the top of the deflection yoke so that the convergence will not deviate due to an unsteady deflection yoke.
- (8) Gently nudge the yoke from side to side to achieve the best overall convergence on the edges of the screen (See STEP-4 in figure for examples).
Insert wedges at the left side and right side of the deflection yoke so that the convergence will not deviate due to an unsteady deflection yoke. (Do not apply silicon adhesive to the wedges to prevent them from slipping out).
- (9) Check that the image is horizontal.
If needed, rotate the deflection yoke.
- (10) Recheck the purity adjustment. If purity was adversely affected repeat the purity adjustment, then recheck convergence when finished.
- (11) Retighten the deflection yoke fastening screw. Do not overtighten the screw, as this can damage the CRT.
Tightening torque: 18 ± 2 kgf-cm
- (12) Align the horizontal line convergence at the center of the screen with the Differential coil (See STEP-5 in figure for examples).
- (13) Align the horizontal line convergence at the bottom and of the screen with the Differential resistor VR4. (See STEP-6 in figure for examples).
- (14) Align the horizontal line convergence at the top of the screen with the Differential resistor VR3 (See STEP-7 in figure for examples).

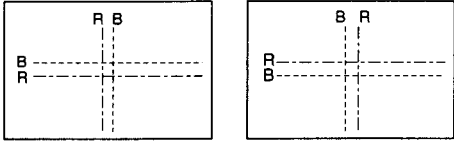
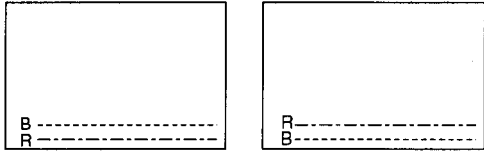
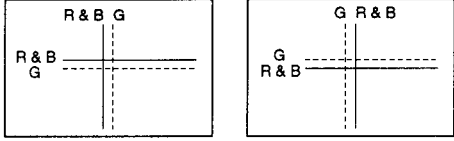
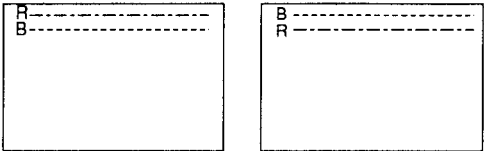
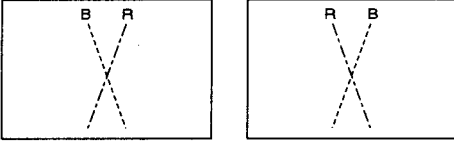
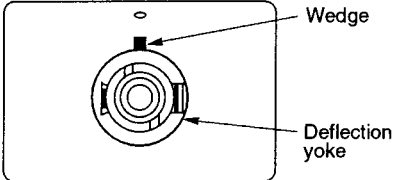

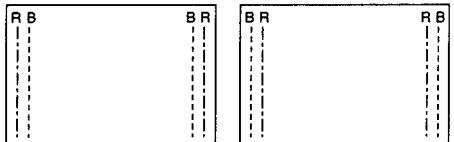
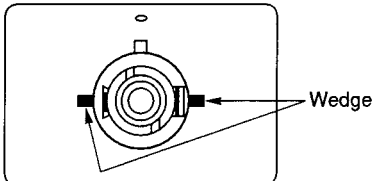
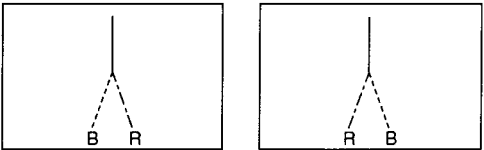
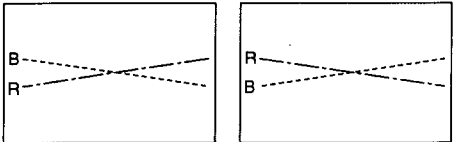
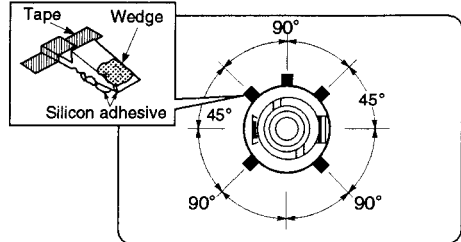
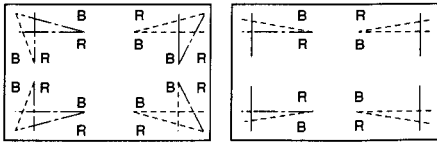
- (15) Align the center vertical line convergence at the top of the screen with the Vertical Isotropic Astigmatism resistor VR1 (See STEP-8 in figure for examples).
- (16) Align the center vertical line convergence at the bottom of the screen with the Vertical Isotropic Astigmatism resistor VR2 (See STEP-9 in figure for examples).
- (17) Recheck convergence at the center of the screen. If needed, realign with the Four-pole magnet and the Six-pole magnet.
- (18) Insert wedges as shown in STEP-10 of figure (at the top, bottom, and right side of the deflection yoke). Secure them with silicon adhesive and polyester tape. Remove any temporary wedges while keeping convergence aligned.
- (19) If the convergence on the fringe areas is still not acceptable, place one or more Permalloys around the funnel to achieve the best effect. Then press these Permalloys onto the funnel. Verify convergence around all edges of the screen. (See STEP-11 in figure for examples).

NOTE

In the above step, do not place the Permalloys closer than 20 mm from the HV anode cap. Do not tape them over any paper labels or secure them with silicon adhesive.

- (20) After completion of adjustment, apply locking paint to the movable portions of the deflection and convergence yokes to secure them.



Adjustment part	Misconvergence pattern Wedge inserting position	Adjustment part	Misconvergence pattern Wedge inserting position
Four-pole magnet B	STEP-1 	Differential resistor (VR4) YV (S)	STEP-6 
Six-pole magnet	STEP-2 	Differential resistor (VR3) YV (N)	STEP-7 
Deflection yoke	STEP-3  <p>Tilting the yoke up Tilting the yoke down</p>  <p>Rear view of the CRT</p>	Vertical Isotropic Astigmatism resistor (VR1) YH (N)	STEP-8 
Deflection yoke	STEP-4  <p>Tilting the yoke left Tilting the yoke right</p>  <p>Rear view of the CRT</p>	Vertical Isotropic Astigmatism resistor (VR2) YH (S)	STEP-9 
Differential coil	STEP-5 	Permalloy	STEP-10  <p>Wedge spacing and how to tape</p>
	STEP-11 		

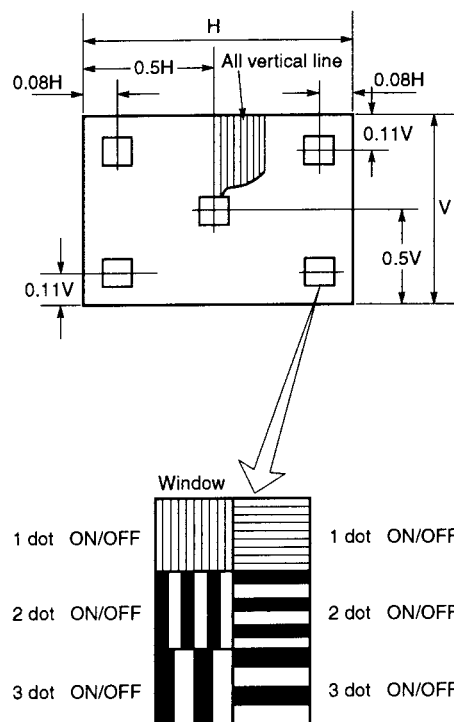
CHECK ITEM

These items are intended for a recheck after adjustment and for a check of the following function operations:

1. Resolution check
2. Brightness variation check
3. Gradation check
4. Brightness check
5. Deflection linearity check
6. Distortion check
7. Image stability check
8. Blinking image check
9. Circuit operation check
10. Specific function check
11. Power save function check

1. Resolution Check

- (1) Apply resolution check pattern.



- (2) Check with the normal signal and inverted signal. Check to be sure that display color between dots is uniform and that there are no color difference and spotty display color.
- (3) Check the entire image quality including resolution.

2. Brightness Variation Check

- (1) Cause the white full dot pattern to be displayed with the Mode-2 signal.
- (2) Set the contrast to a maximum. Set the brightness to the center.
- (3) Make sure that a brightness difference between the center and periphery is <65% with the horizontal magnetic field in the condition of $\pm 30 \mu\text{T}$.

3. Gradation Check

- (1) Cause the 16 grayscale to be displayed with the Mode-2 signal. (White gradation waves.)
- (2) Set the contrast to a maximum and the brightness to the center.
- (3) At this time, the 1st gradation (black level) cannot be seen and the 2nd gradation must be barely lit.
- (4) With the brightness set to the center, vary the contrast from the maximum point and the gradation tracking must be good at that time.

Note: If tint (particularly the gray, which is a middle color) is different, make adjustment of the white balance once again.

- (5) With the contrast set to a maximum, vary the brightness from the maximum point to the minimum point and check to be sure that the brightness of the low gradation portion changes.

Note: Check both the color select 9300K and 6550K.

4. Brightness Check

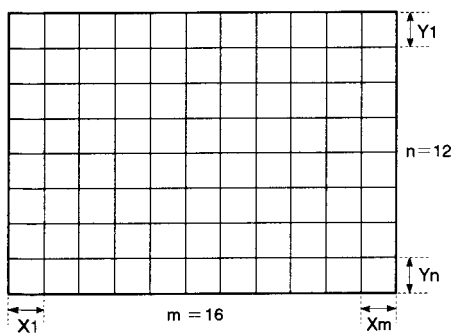
- (1) Cause the white full-flat field pattern to be displayed with the Mode- 2 signal.
- (2) Make sure that the brightness value is $< 17 \text{ cd/m}^2$ when the contrast is set to a minimum and the brightness to the center.

5. Deflection Linearity Check

- (1) Display the green only crosshatch pattern.

$$\text{Horizontal linearity} = \frac{X_{\text{max.}} - X_{\text{min.}}}{X_{\text{max.}} + Y_{\text{min.}}} \times 100\%$$

$$\text{Vertical linearity} = \frac{Y_{\text{max.}} - Y_{\text{min.}}}{Y_{\text{max.}} + Y_{\text{min.}}} \times 100\%$$



- (2) To confirm the horizontal deflection linearity, proceed in the next input signal modes:

Mode-1 }
 Mode-2 } 6%
 Mode-3 }

To confirm the vertical deflection linearity, proceed in the following input signal modes:

6. Distortion Check

- (1) Apply the signal of the following mode and supply the green crosshatch pattern.

Mode-1

Mode-2

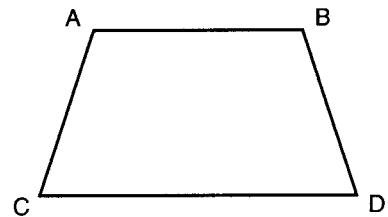
Mode-3

- (2) Make sure that each value comes within the value indicated above.

• Distortion

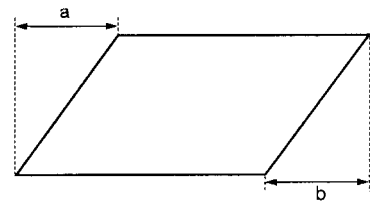
• Trapezoid

$$\begin{aligned} |AC - BD| &\leq 3\text{mm} \\ |AB - CD| &\leq 4\text{mm} \end{aligned}$$



• Parallelogram

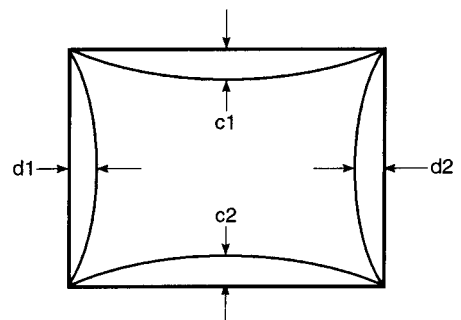
$$a, b \leq 3\text{mm}$$



• Pincushion and barrel

$$|c1|, |c2| \leq 3.0 \text{ mm}$$

$$|d1|, |d2| \leq 3.0 \text{ mm}$$

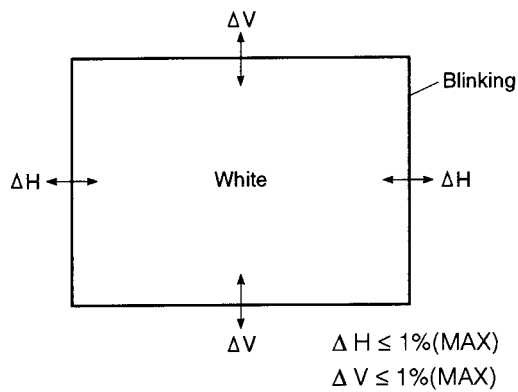


7. Image Stability Check

- (1) Check to be sure that the size variations are < 2 mm for horizontal size and < 1.5 mm for vertical size when the white full dot pattern of Mode-1 is displayed and the AC voltage is changed to 90 ~ 264 V.
- (2) Make sure that the size variations are < 2 mm for horizontal size and < 1.5 mm for vertical size when contrast is changed to a minimum from maximum at the AC voltage of 120 V/240V.

8. Blinking Image Check

- (1) Apply blinking pattern signal. (100%)



- (2) Check the image stability at Mode-1.
Check if image changes due to blinking meets the standards below using the microscope.

9. Circuit Operation Check

- (1) Check the protection operation at fH not covered in the specifications.
- (2) Apply fH = 28 KHz and 84KHz signal and check to be sure that sync flows.

10. Specific Function Check

- (1) Create the crosshatch pattern using the Mode-2 signal of the preset timing.
- (2) Vary the variations of the vertical size and the deviation of the horizontal size and check to be sure that the horizontal size and horizontal position variations meet the values given below.

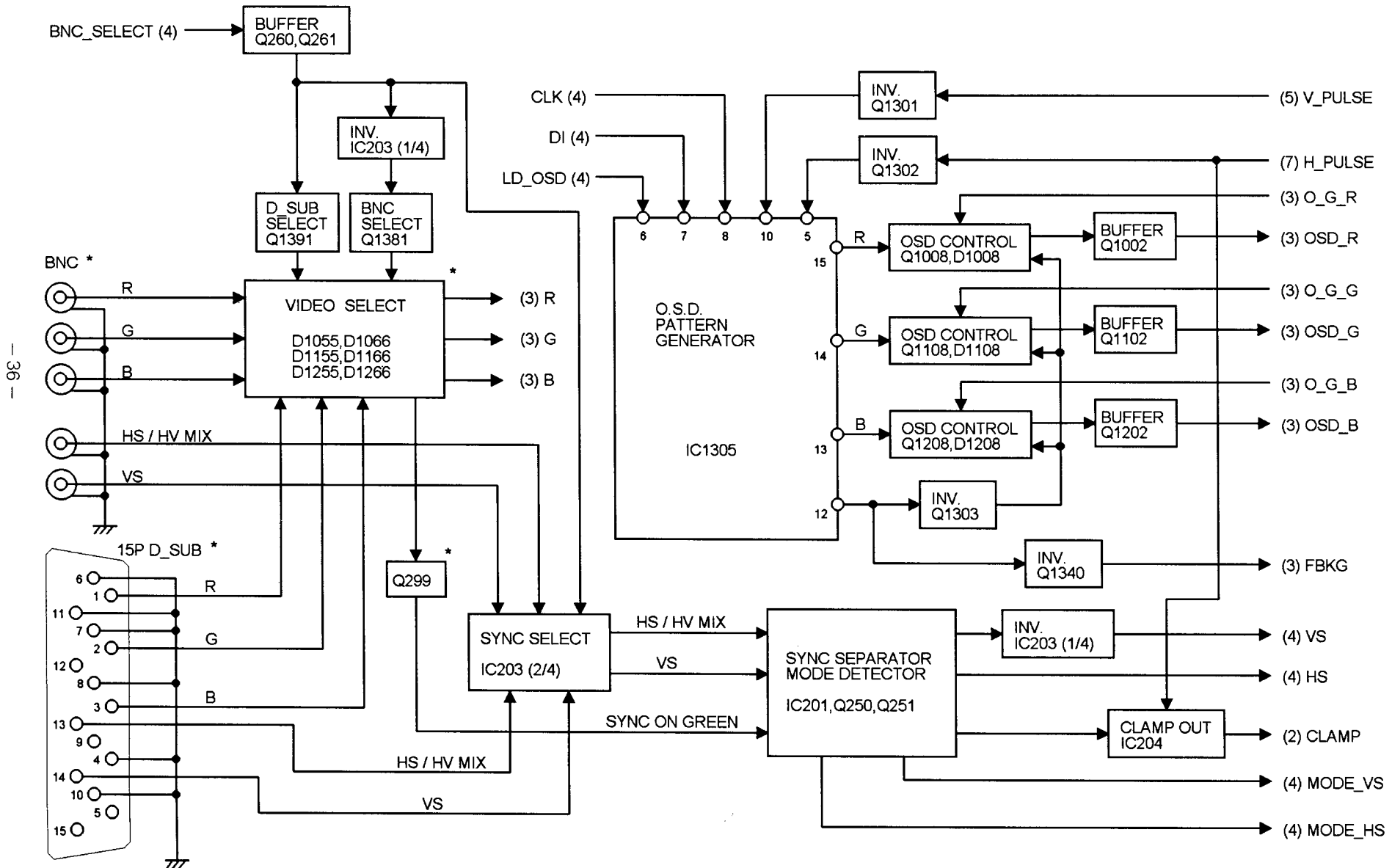
Vertical size	→ Full scan
Vertical position	→ up and down 5 mm or more
Horizontal size	→ Full scan
Horizontal position	→ left 40 mm or more
Horizontal position	→ right 40 mm or more

11. Power Save Function Check

The power consumption must meet the specifications when the horizontal/vertical sync signals are changed as shown below.

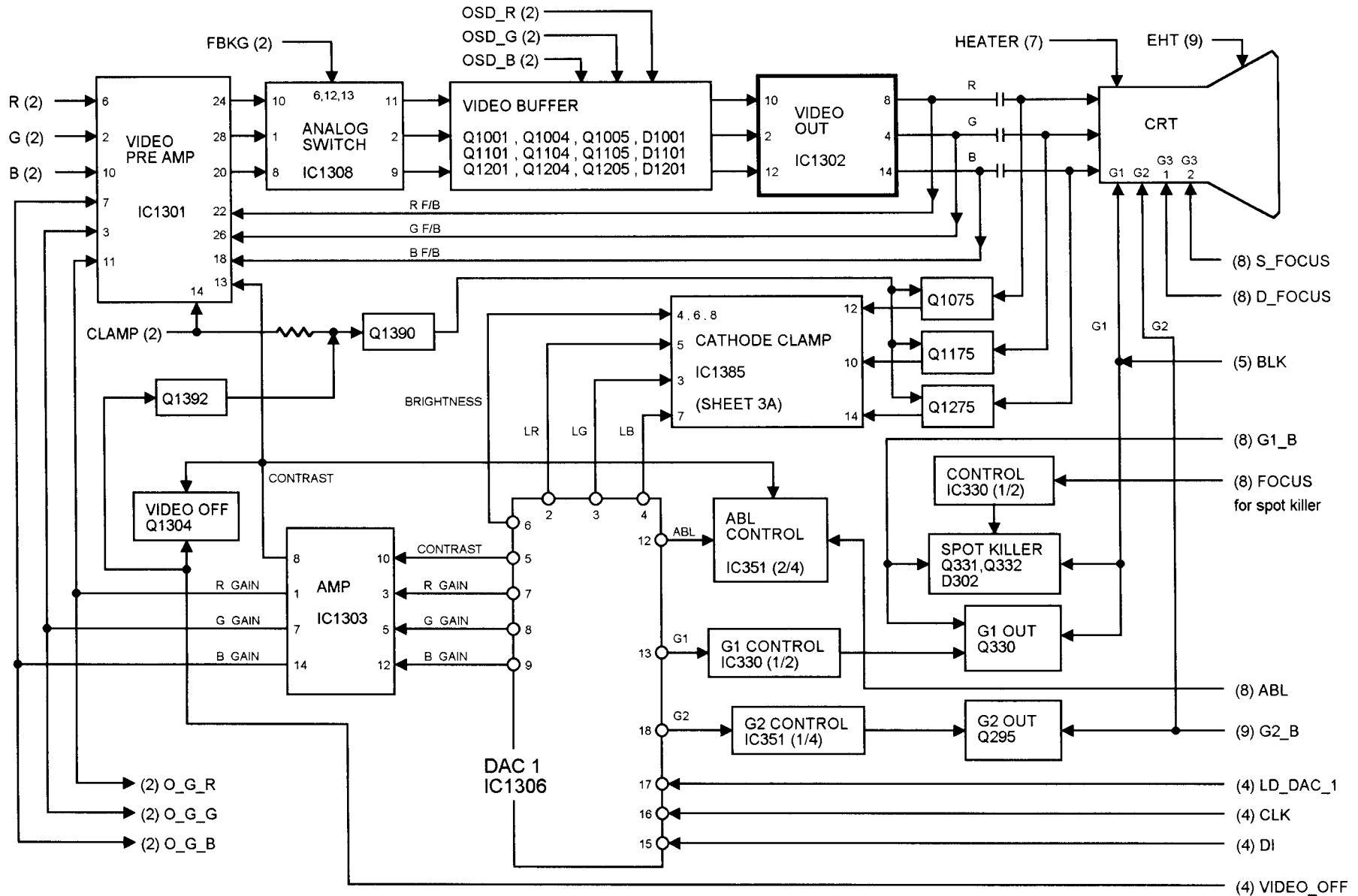
H. SYNC	OFF	ON	OFF
V. SYNC	ON	OFF	OFF
SPEC	< 30W	< 30W	< 8W

SHEET (1) SIGNAL SELECT * / SHEET (2) SYNC SEPARATE

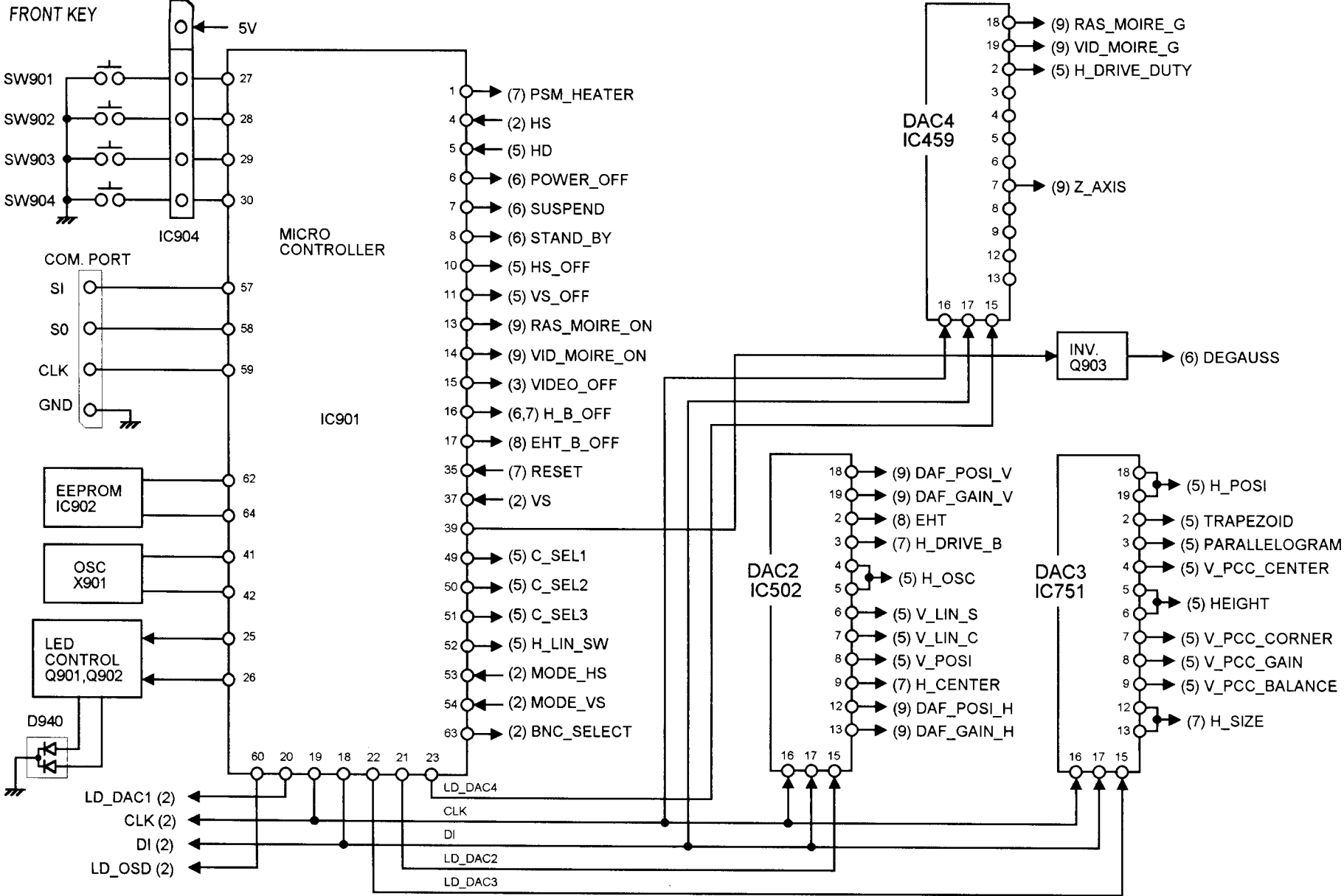


BLOCK DIAGRAM

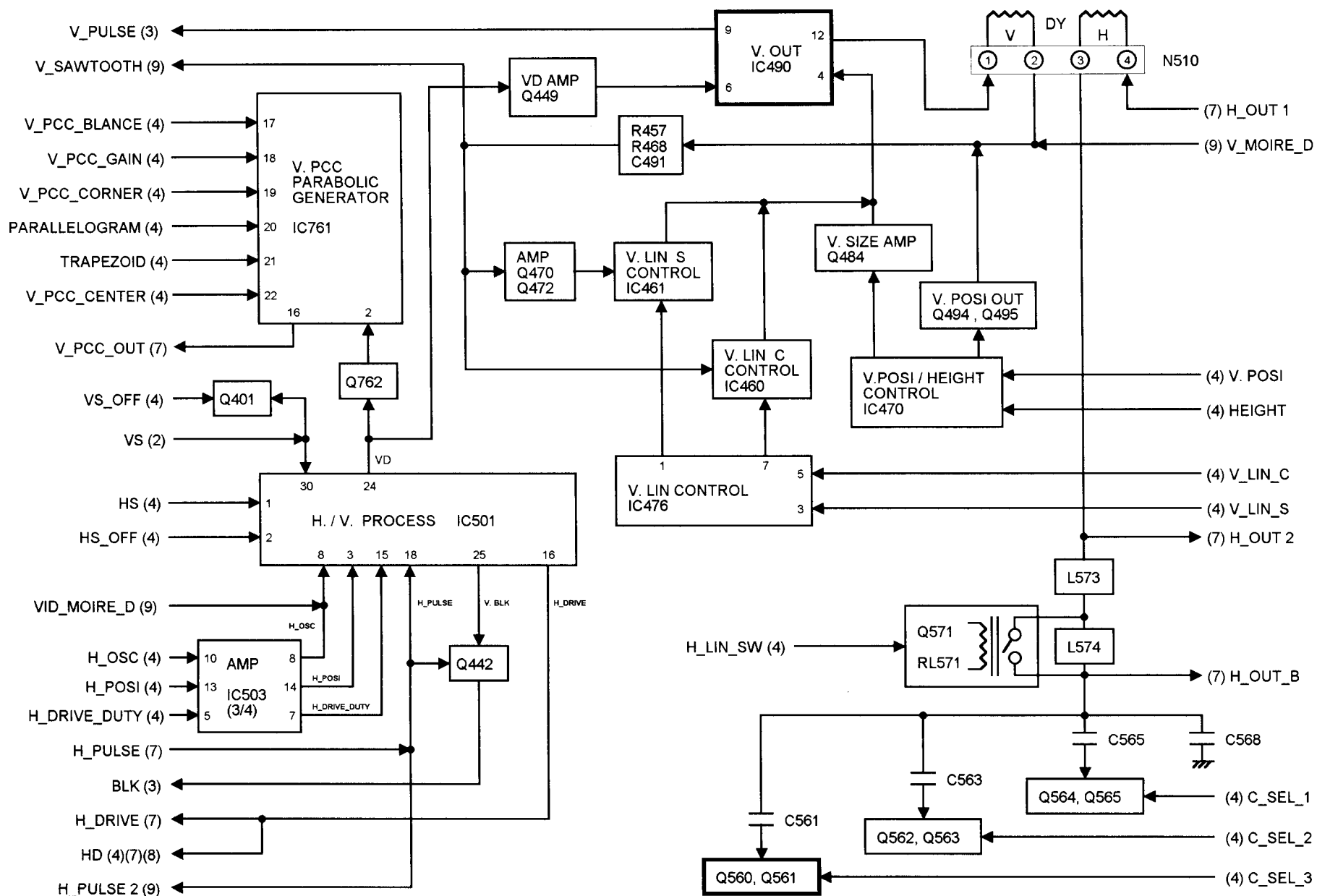
SHEET (3) VIDEO OUT / SHEET (3A) CATHODE CLAMP



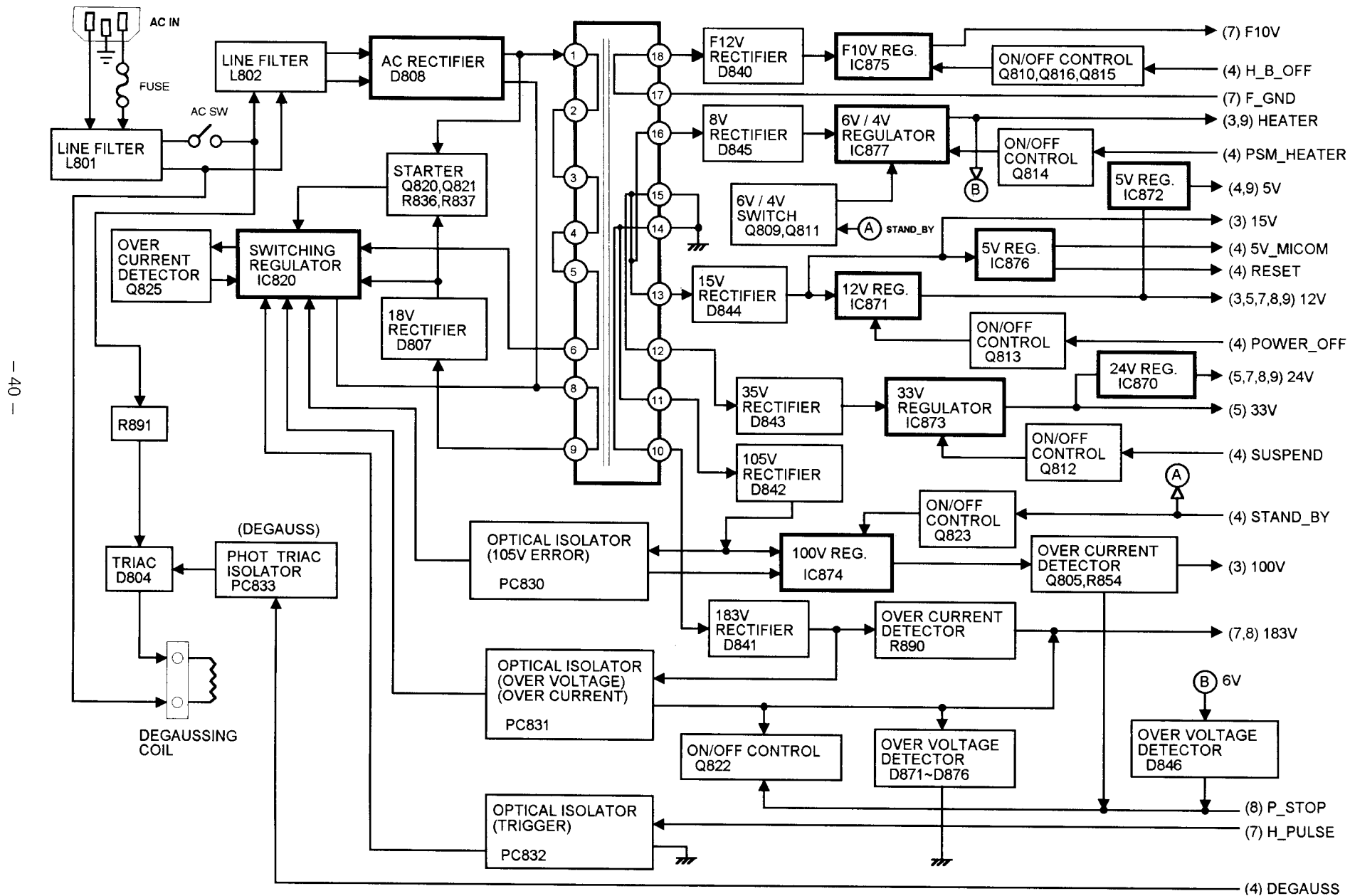
SHEET (4) MICRO CONTROLLER / DIGITAL ANALOG CONVERTER



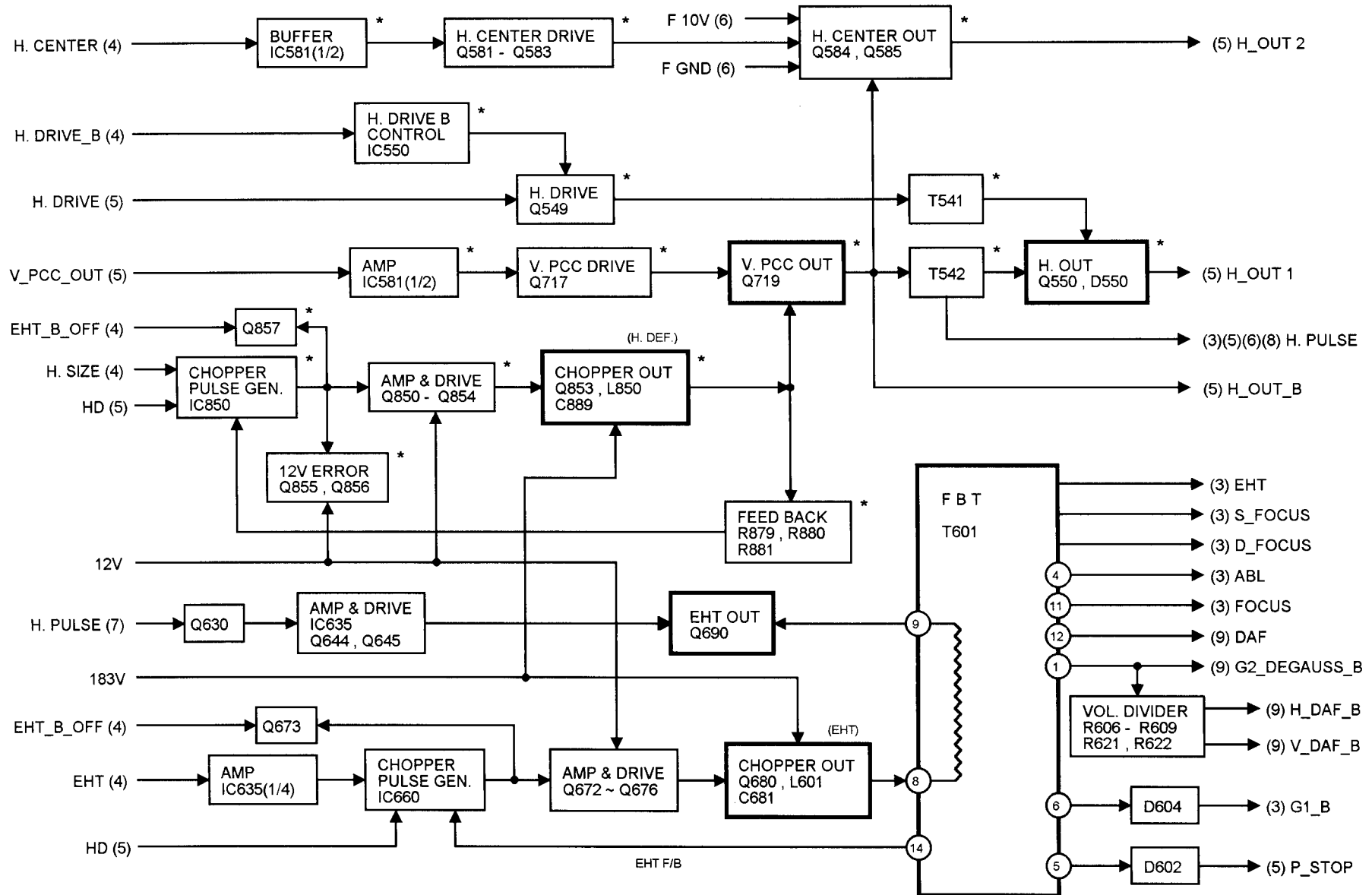
SHEET (5) V. OSC - OUT / V. PCC CONTROL / H. OSC / H. LIN CONTROL



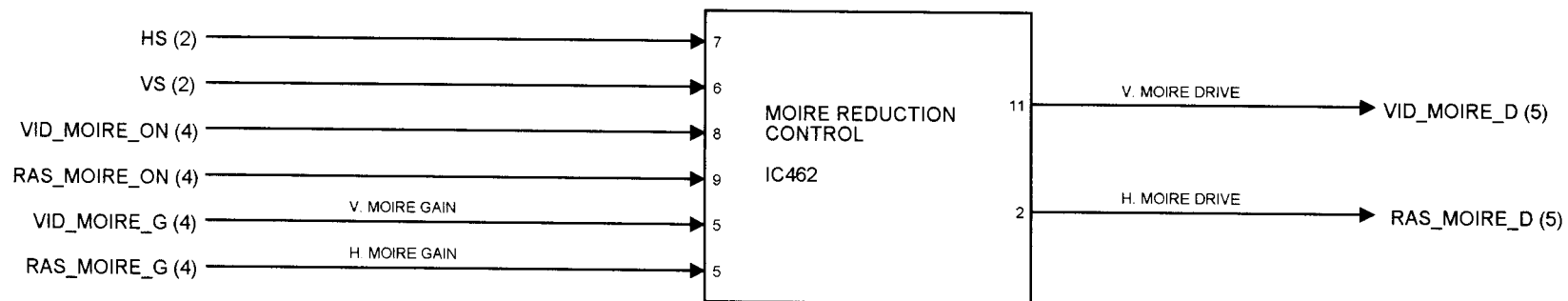
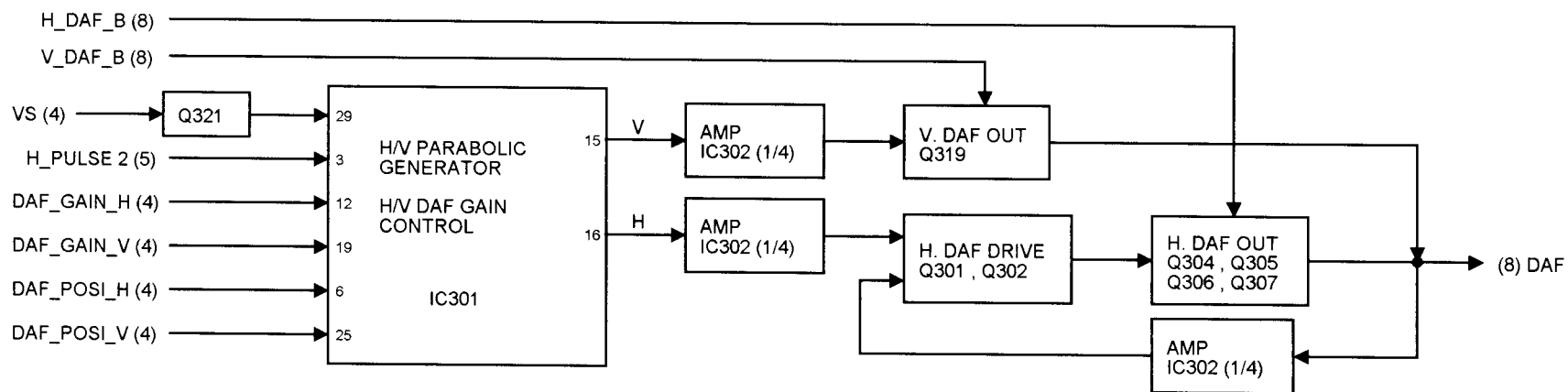
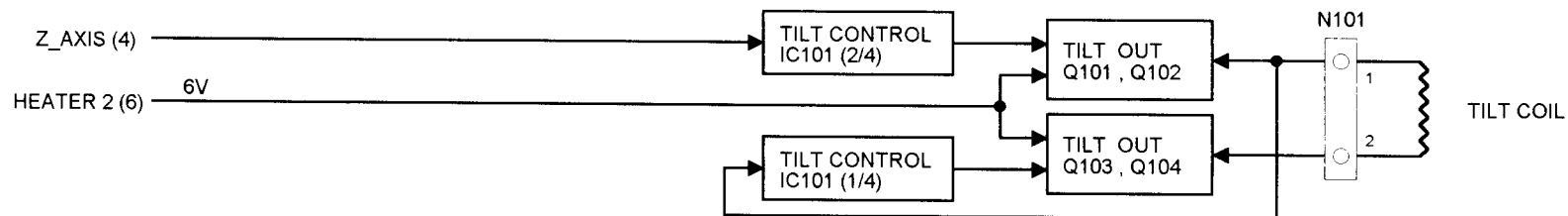
SHEET (6) POWER SUPPLY



SHEET (7) HORIZONTAL DEFLECTION * / SHEET (8) EHT OUT

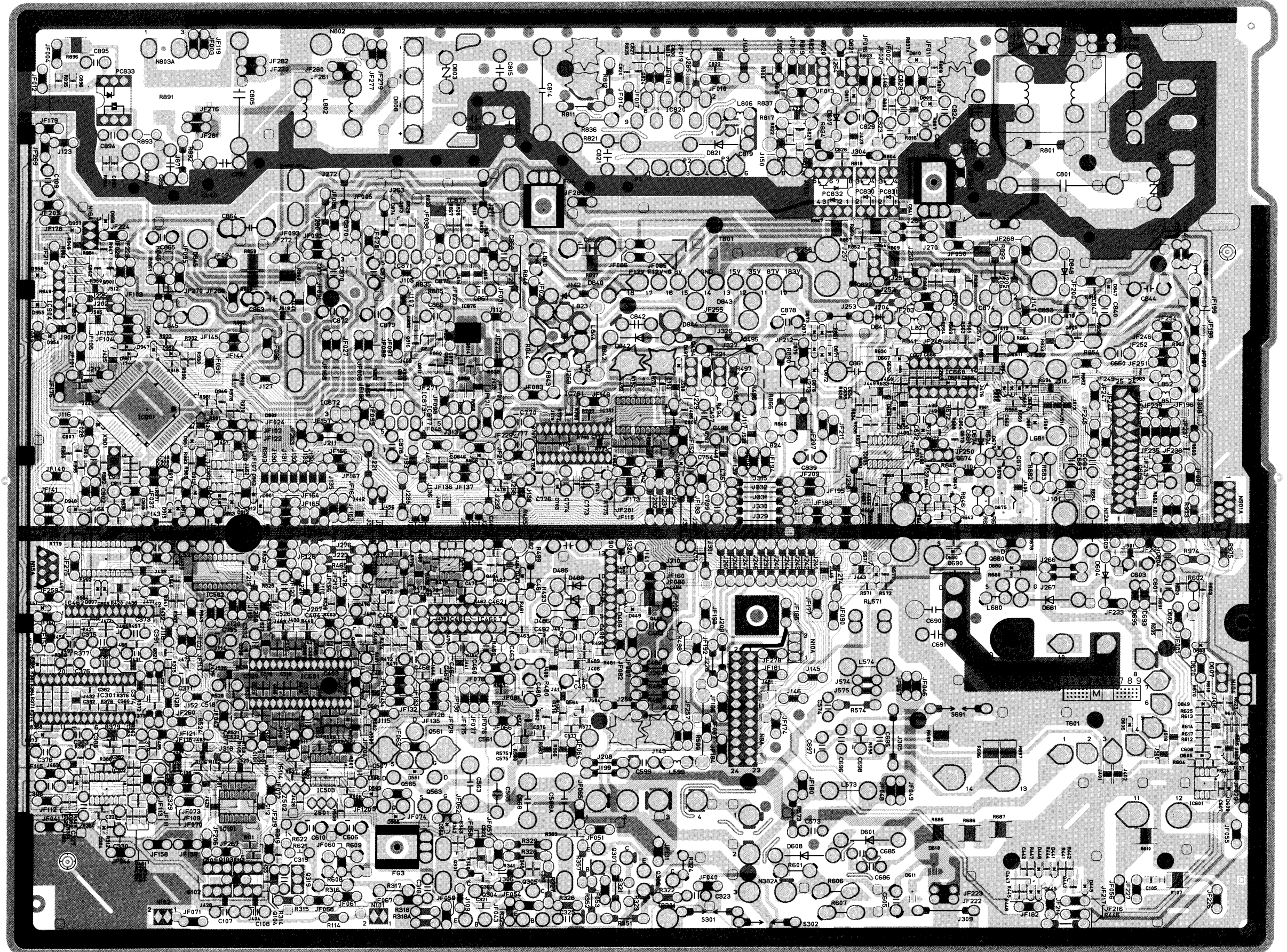


SHETT (9) TILT CONTROL / DAF OUT / MOIRE REDUCTION

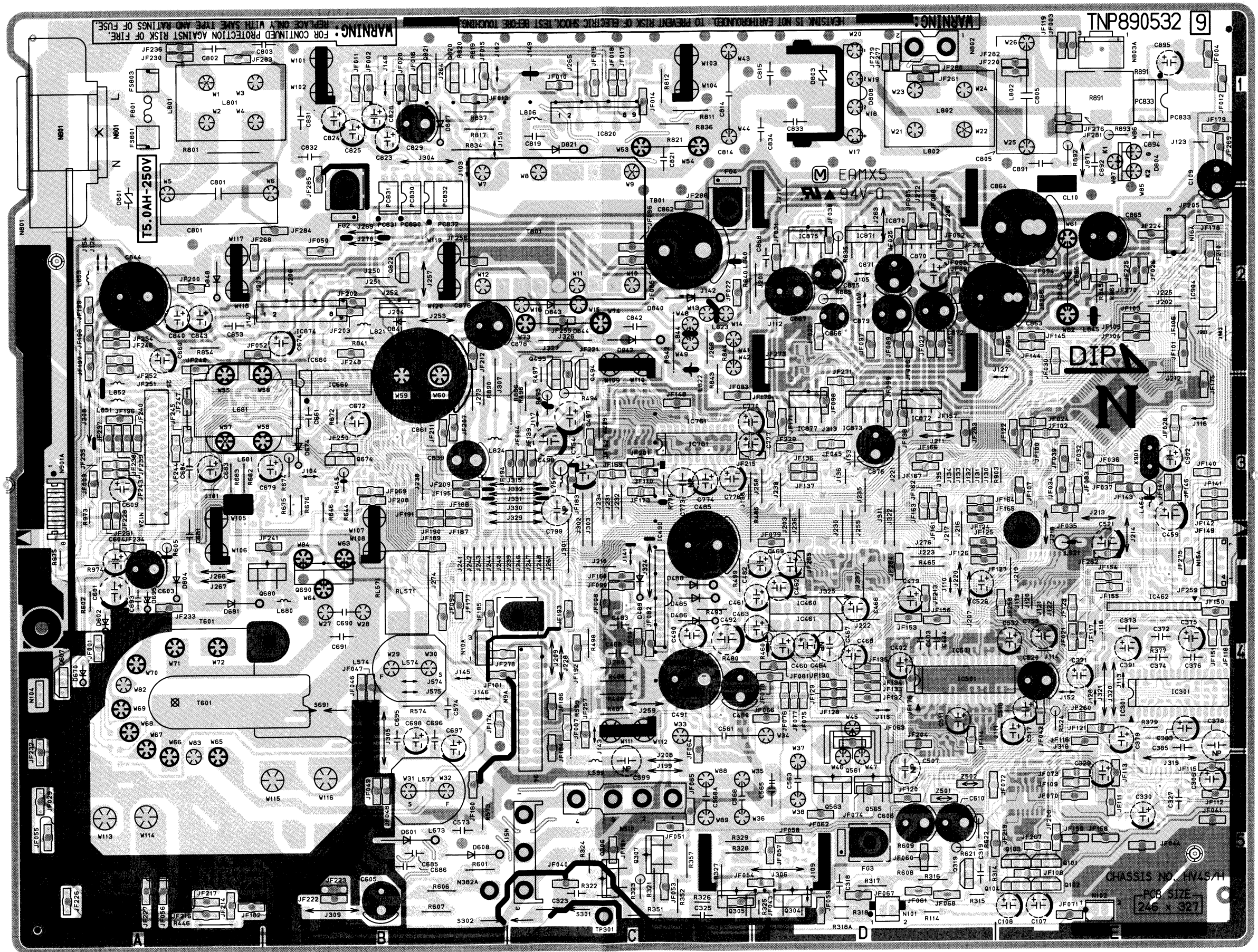


CONDUCTOR VIEW

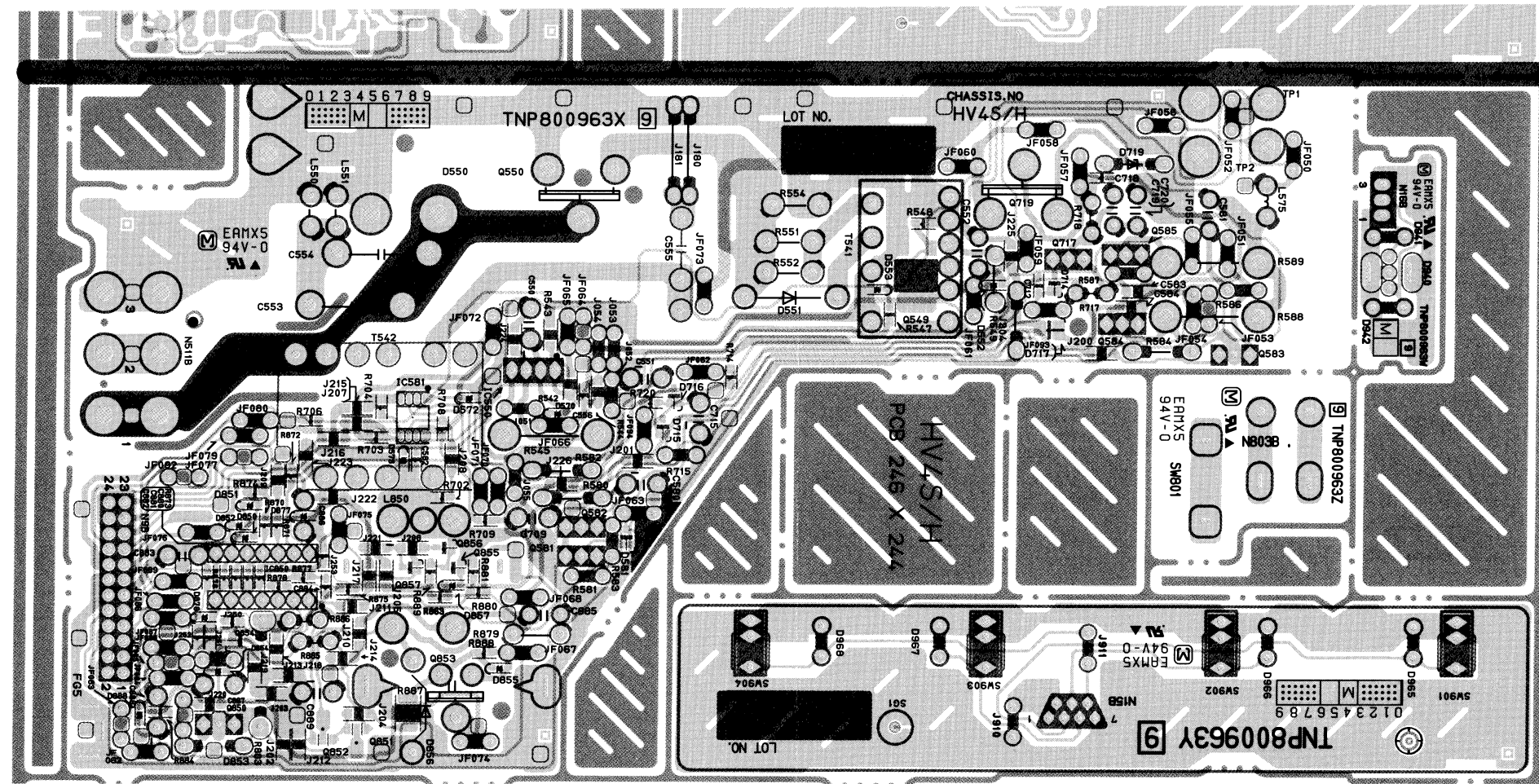
MAIN BOARD (Solder side)



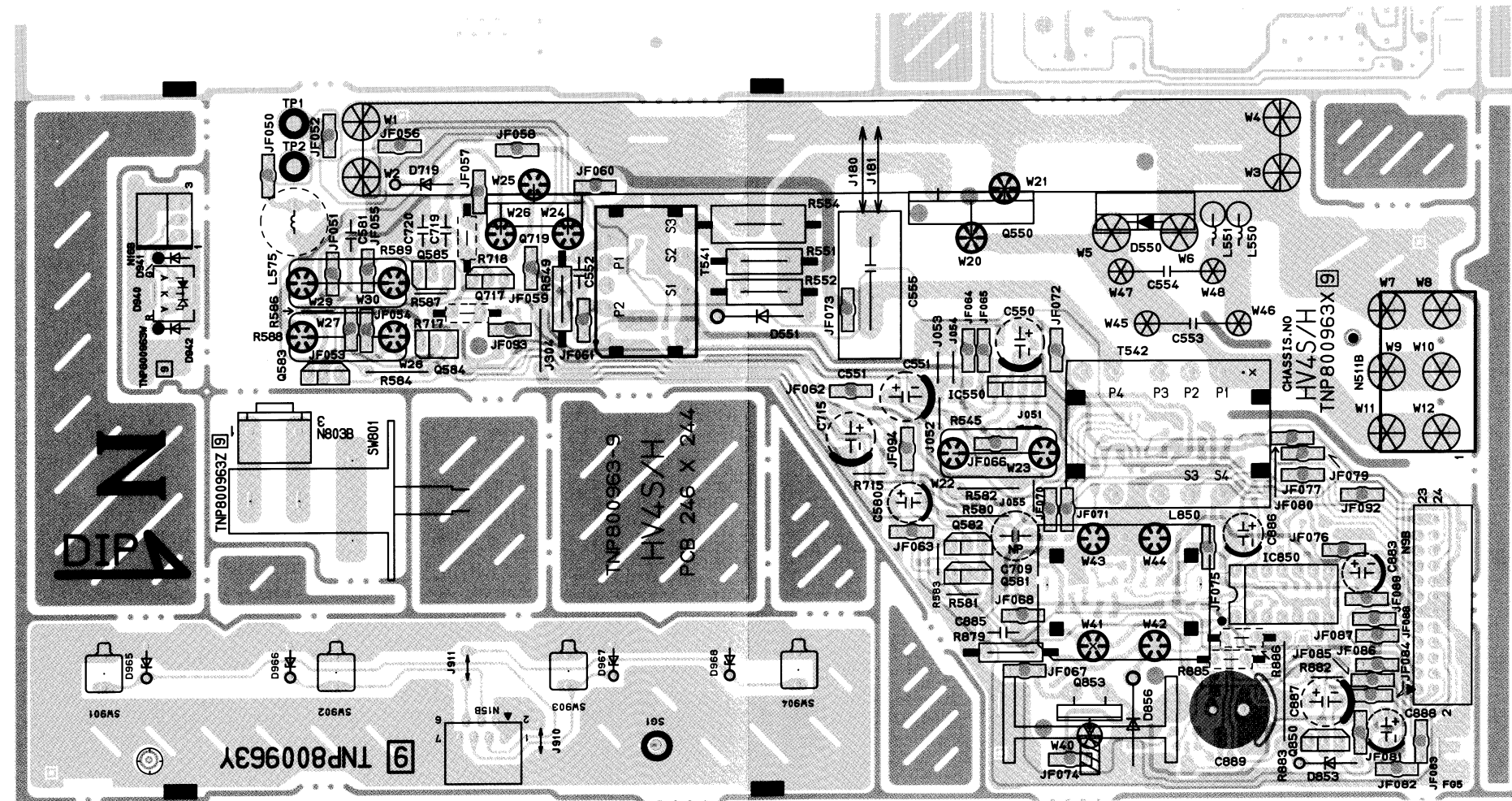
MAIN BOARD (Parts side)



H. DEF. BOARD (Soldr side)




H. DEF. BOARD (Parts side)



SCHEMATIC DIAGRAM










IMPORTANT SAFETY NOTICE

The component identified by shading or international symbol  on the following schematic diagrams incorporate special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for those critical components.

NOTES :












1. RESISTOR

All resistors are carbon 1/4W resistor, unless otherwise noted by the following marks.
Unit of resistance is ohm (Ω), (K = 1,000, M = 1,000,000)

	Non Flammable		Solid
	Metal Oxide		Metal (Precision and high stability)
	Wire Wound		Thermistor
	Fusible		Positive coefficient Thermistor
	Flame Proof Rectangular		

2. CAPACITOR

All capacitors are ceramic 50V capacitor, unless otherwise noted by the following marks.
Unit of capacitance is μ F, unless otherwise noted.

	Electrolytic		Polyester
	Tantalum		Metalized Polyester
	Bipolar		Polypropylene
	Polystyrene		Mica
	Temperature Compensation		Ceramic
			Ceramic (SL)

3. COIL

Unit of inductance is μ H, unless otherwise noted.

4. VOLTAGE MEASUREMENT

Voltage is measured by a digital meter receiving normal signal.

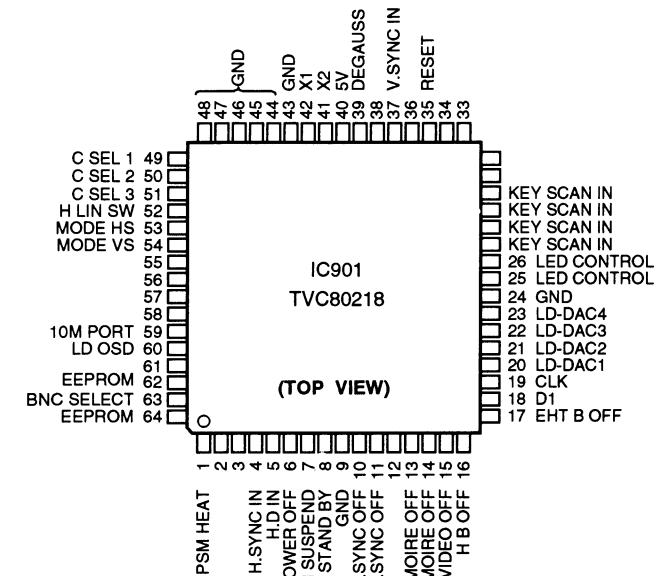
5. This schematic diagram is the latest at the time of printing and is subject to change without notice.

SERVICE NOTES :

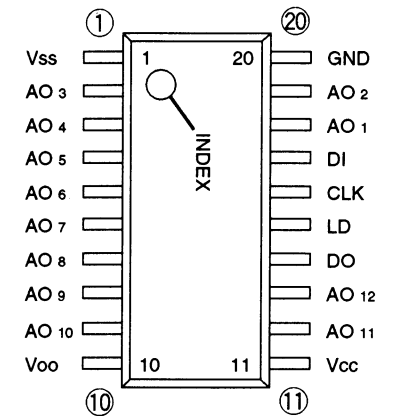
This model has a section that does not share a common ground with the power supply section. The different sections are referred to as the HOT section and the COLD section in the precautions below.

- Do not touch the HOT section and the COLD section at the same time. You may receive an electric shock.
- Do not short the HOT section to the COLD section. This could blow the fuse or damage parts.
- Never measure the HOT section and the COLD section at the same time when using tools such as oscilloscopes or multi-meters.
- Always unplug the unit before beginning any operation such as removing the chassis.

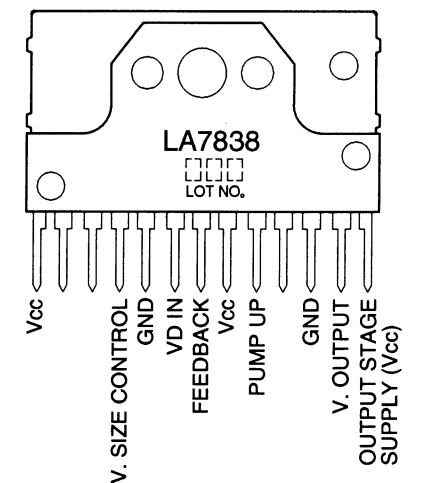
TVC80218 (IC901)



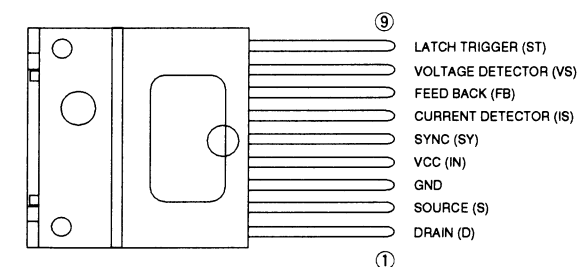
MB88346BPFTF (IC502, IC751, IC1306, IC459)



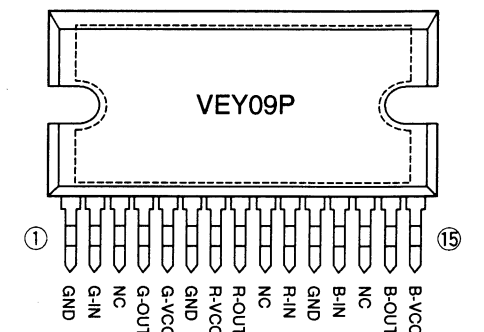
LA7838 (IC490)



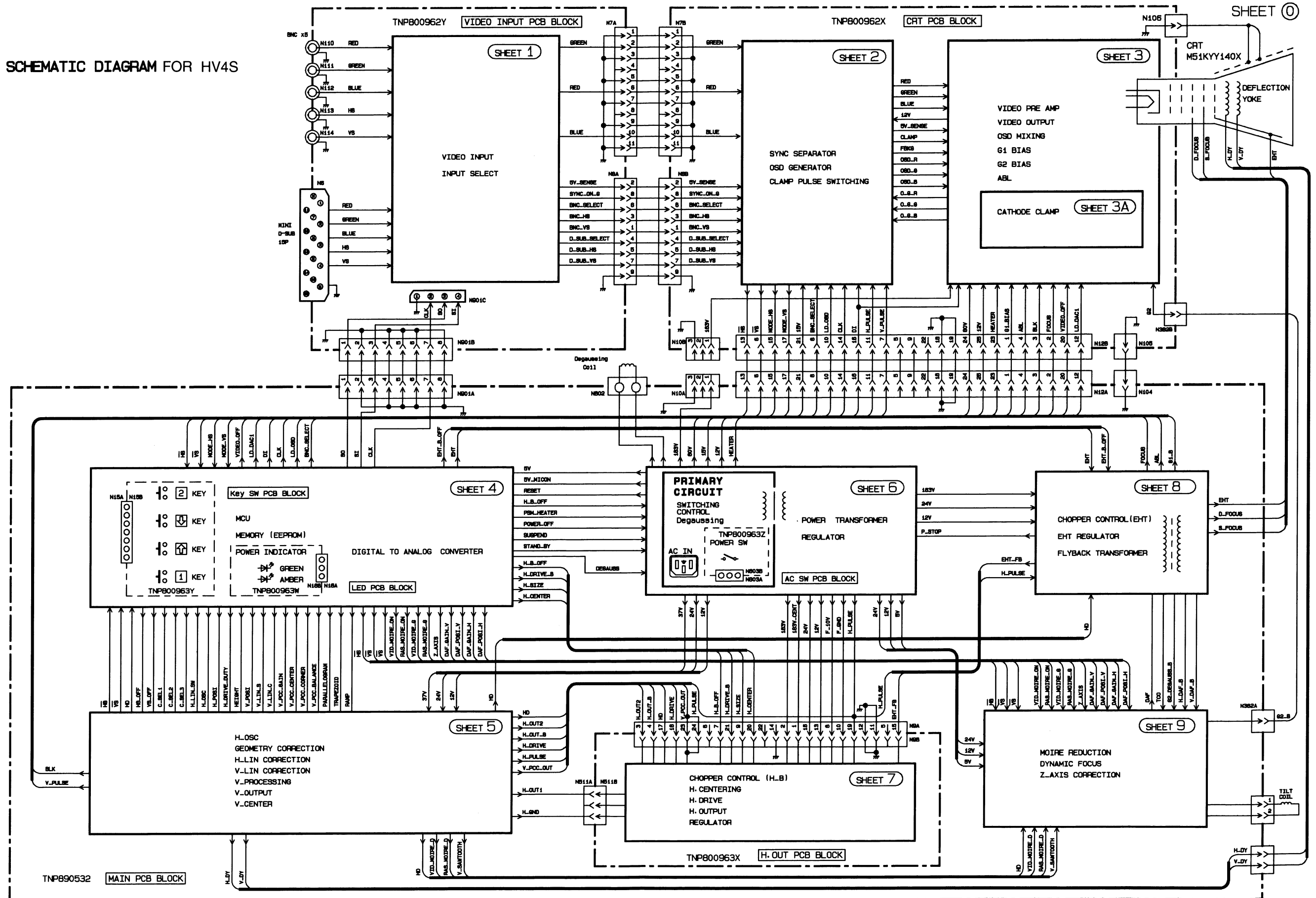
STR-S6533 (IC820)



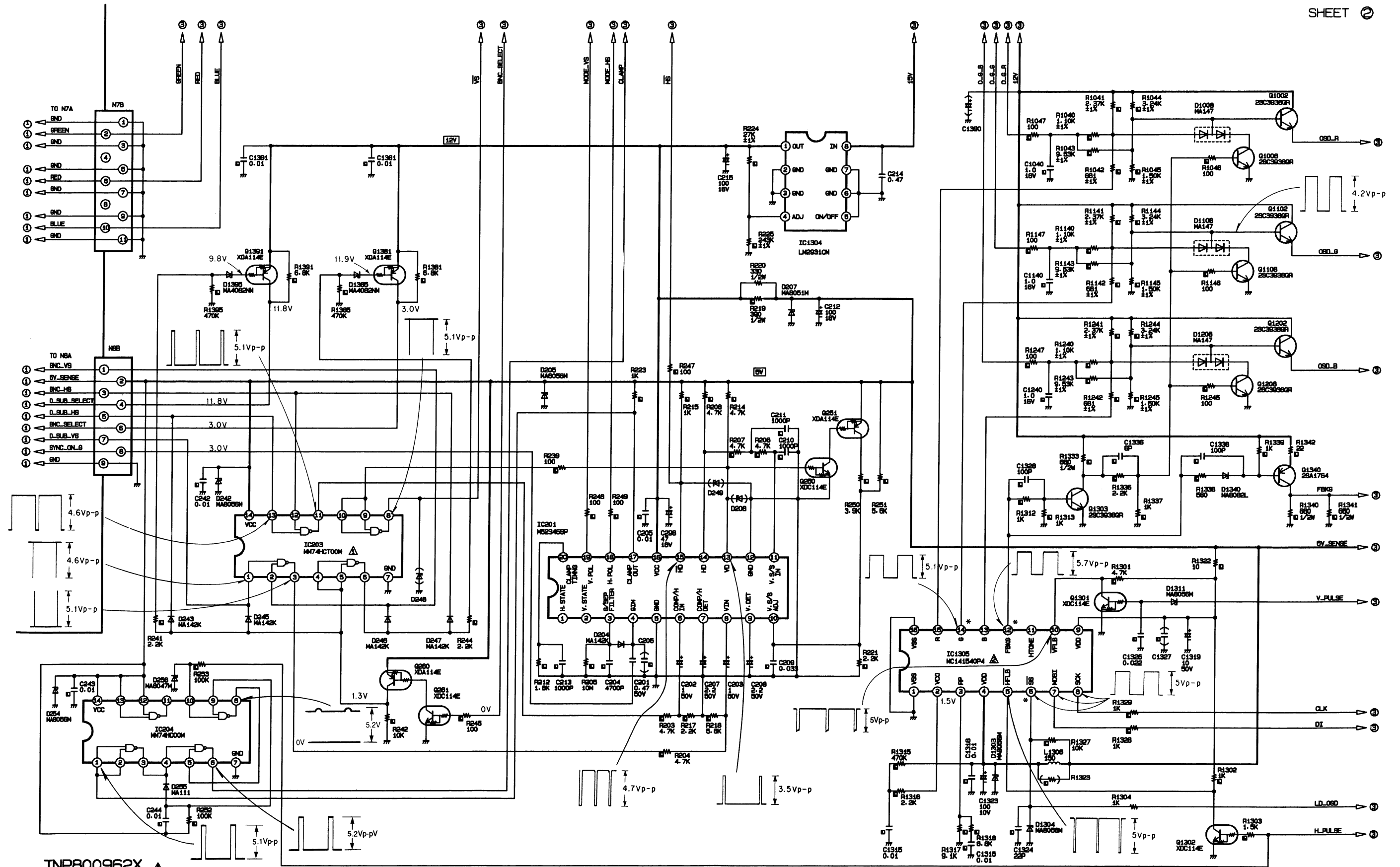
VEY09P (IC1302)



SCHEMATIC DIAGRAM FOR HV4S



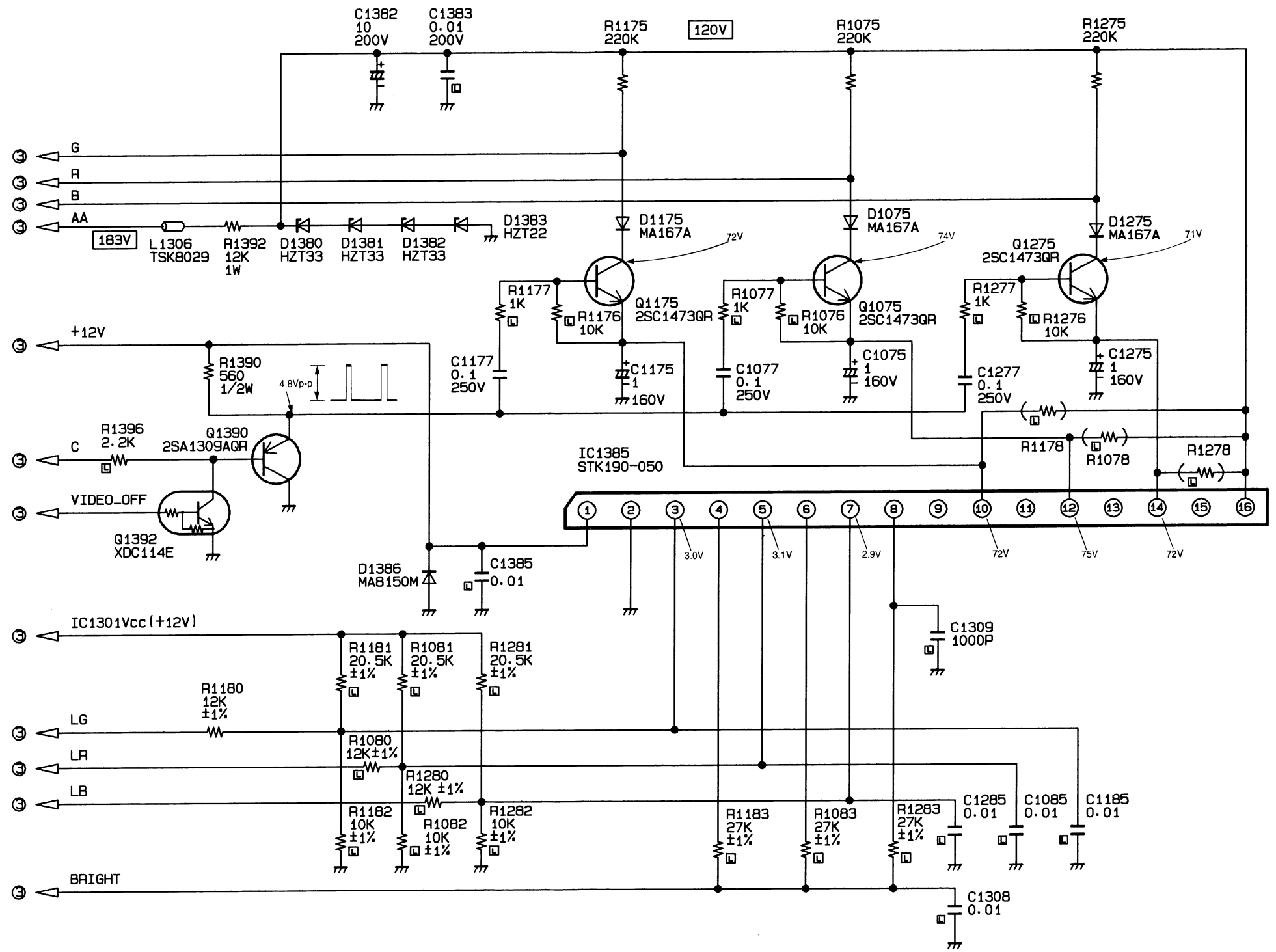


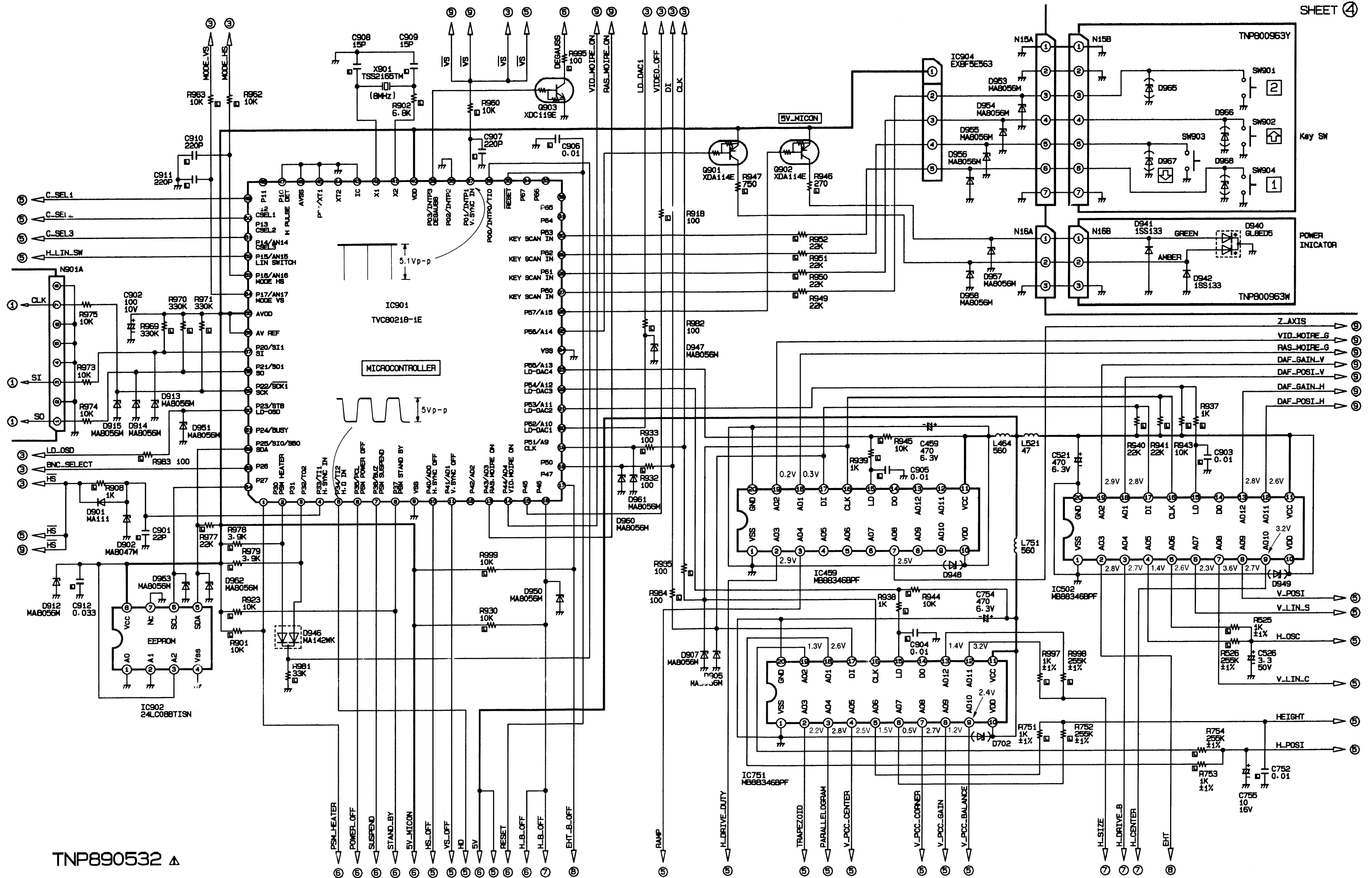


TNP800962X

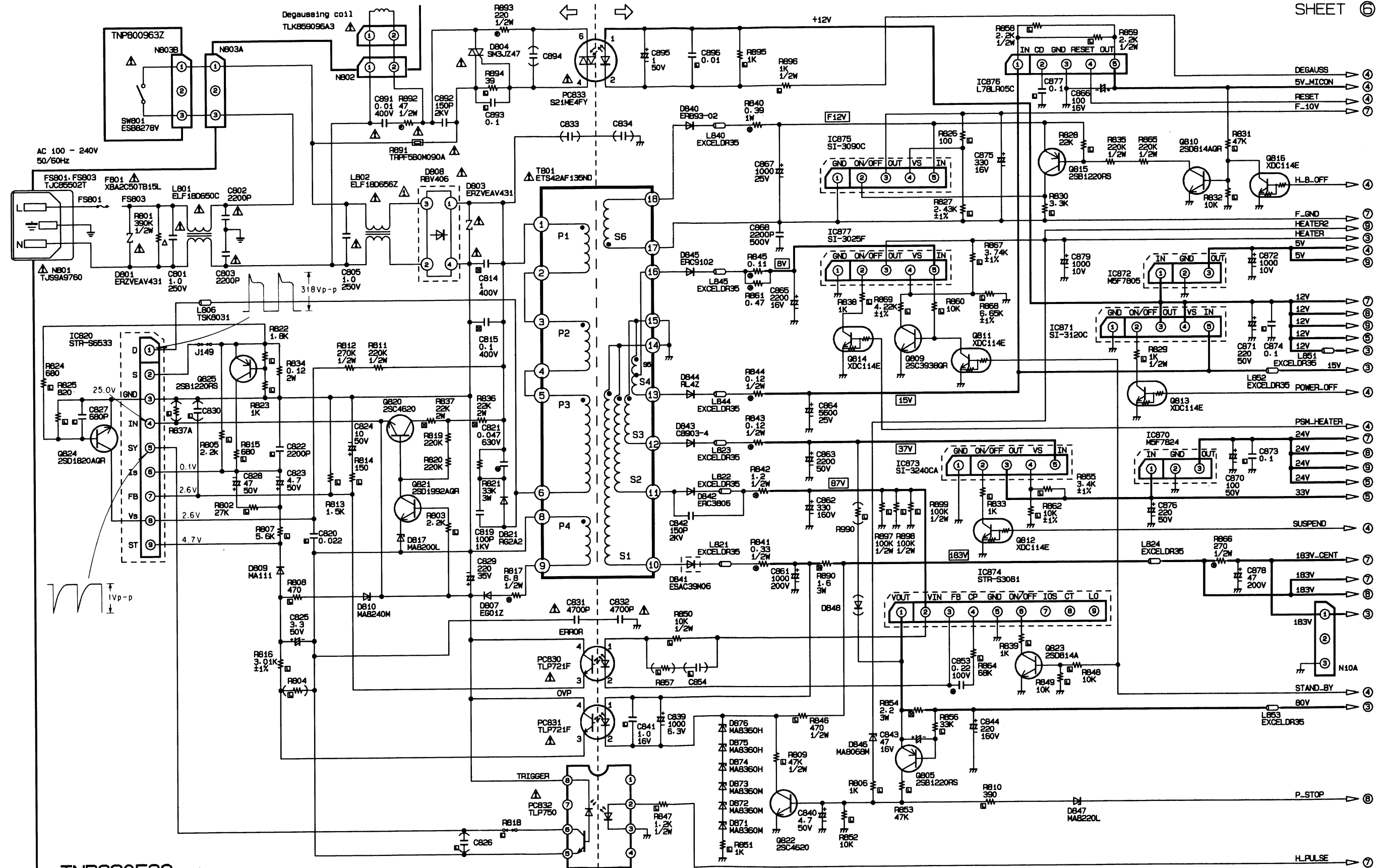
* : AT OSD ON

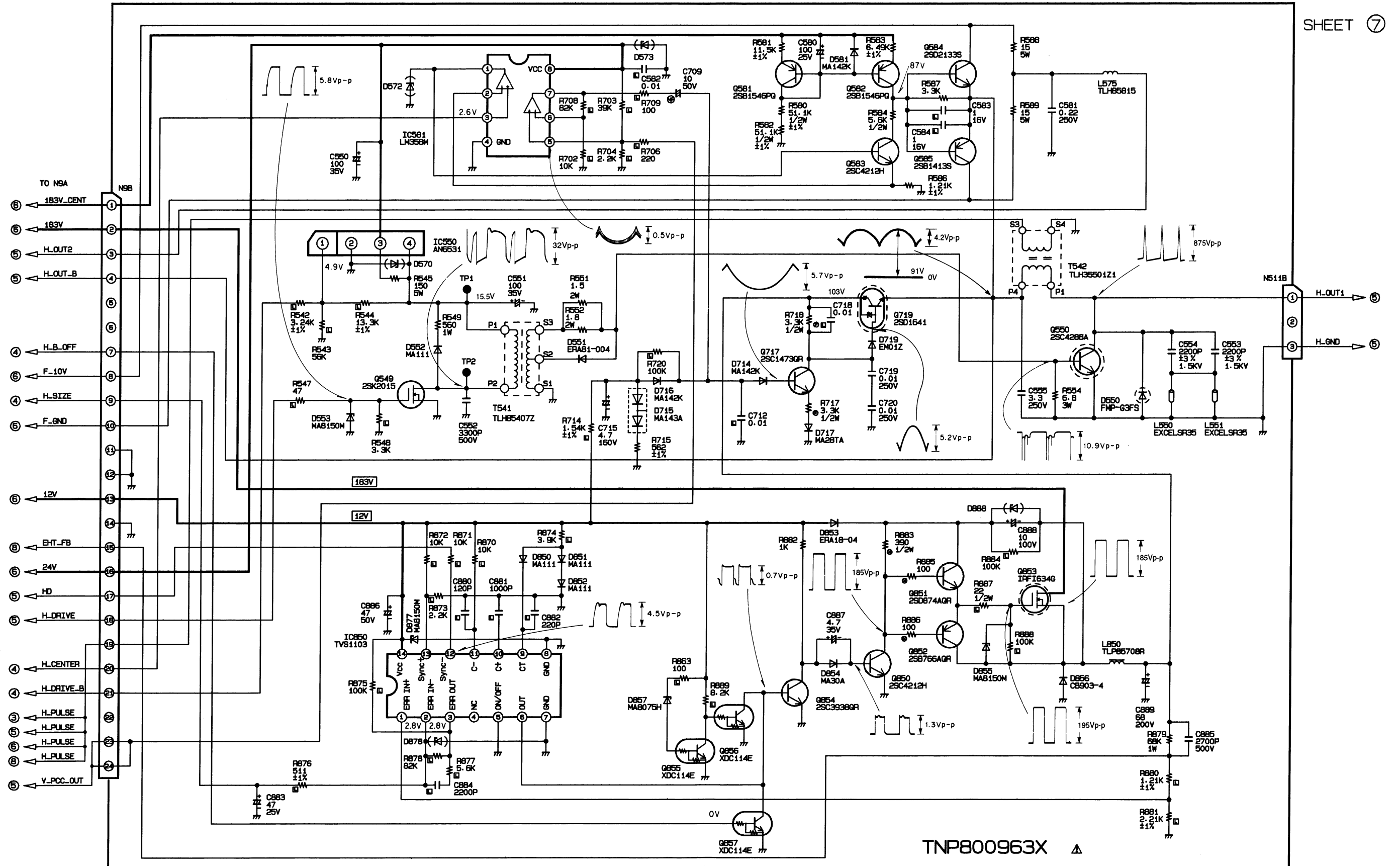
Important safety notice
 Components identified by mark have special characteristics important for safety.
 When replacing any of components, use only manufacturer's specified parts.

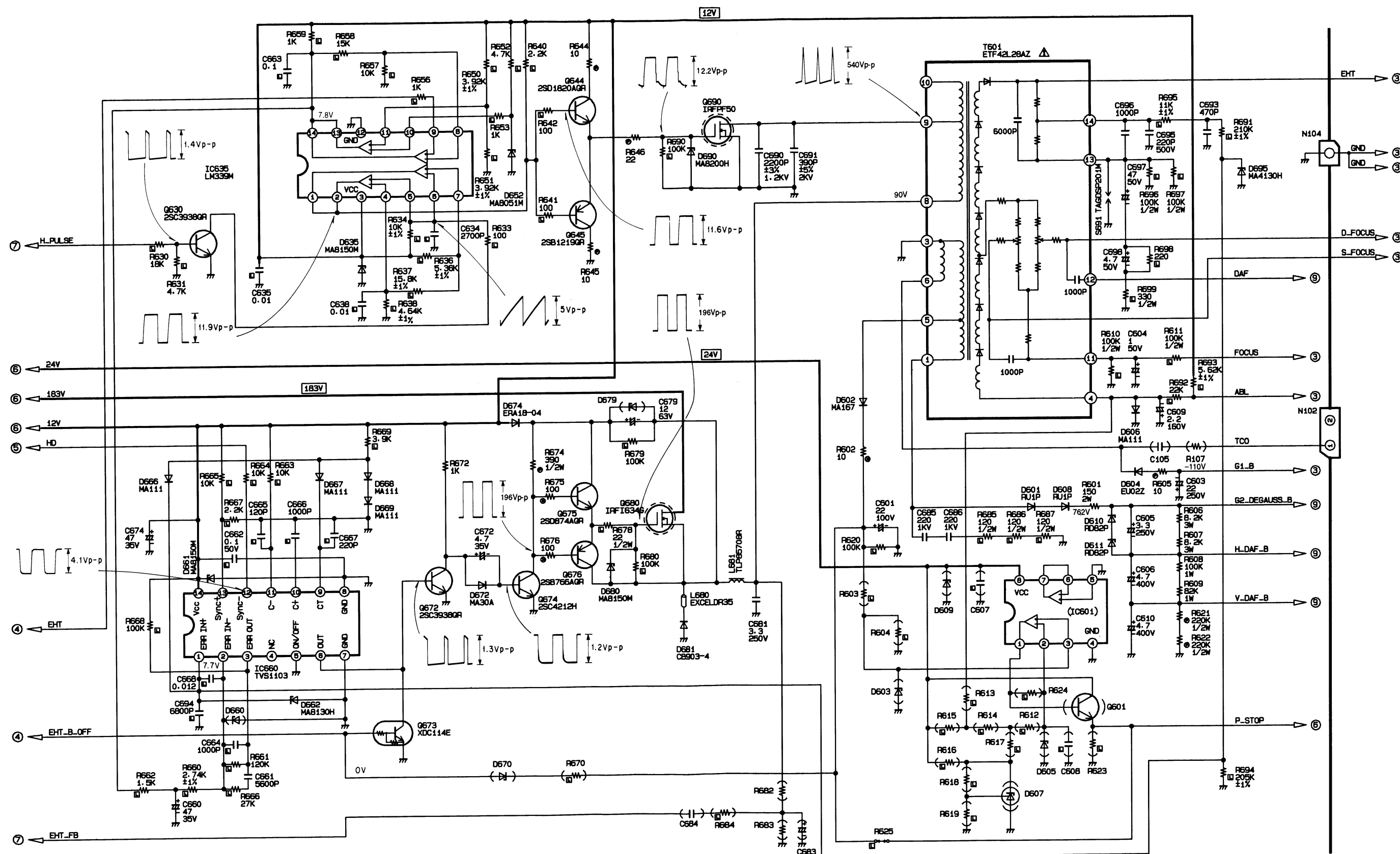




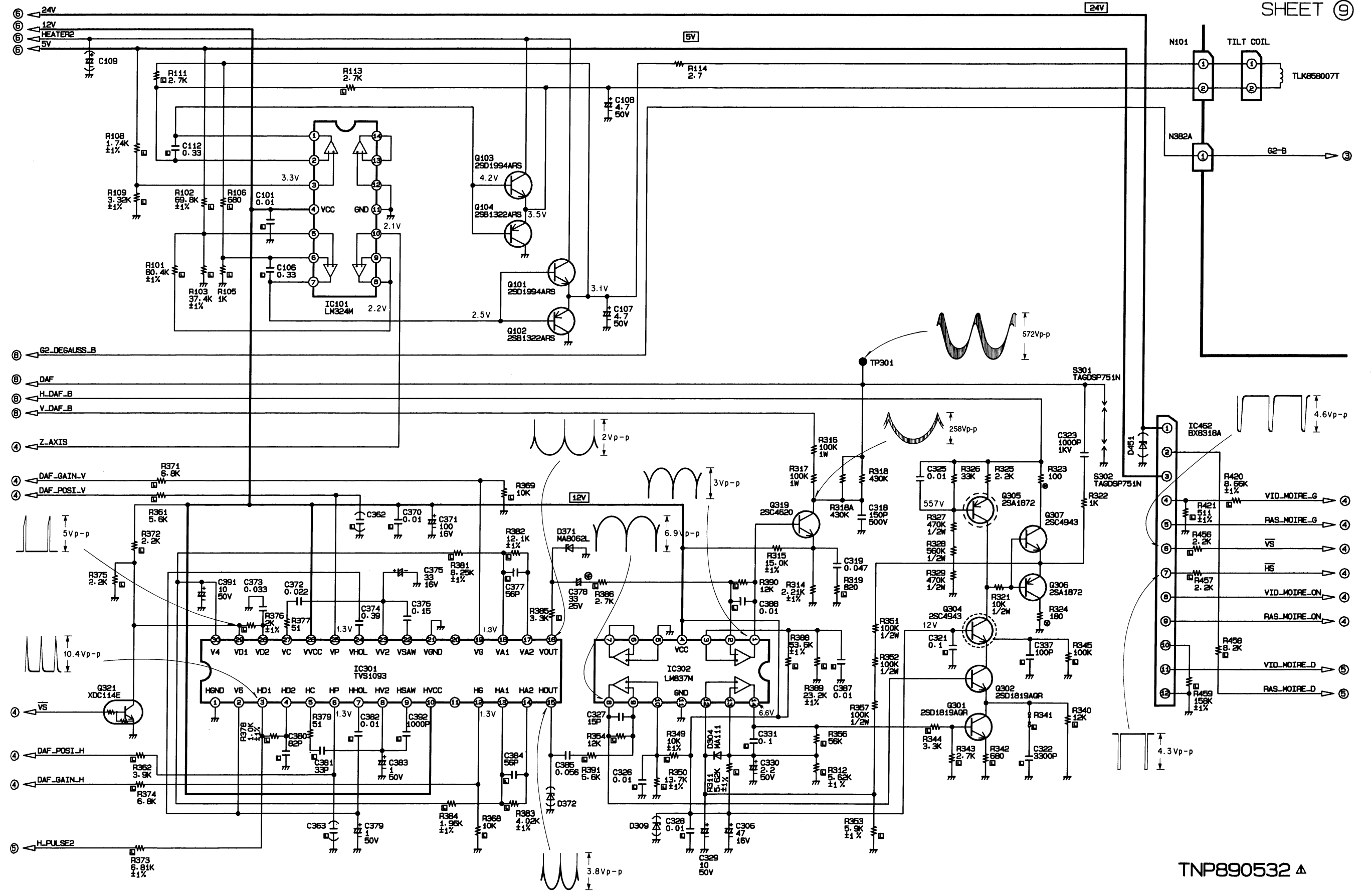
TNP890532 ▲



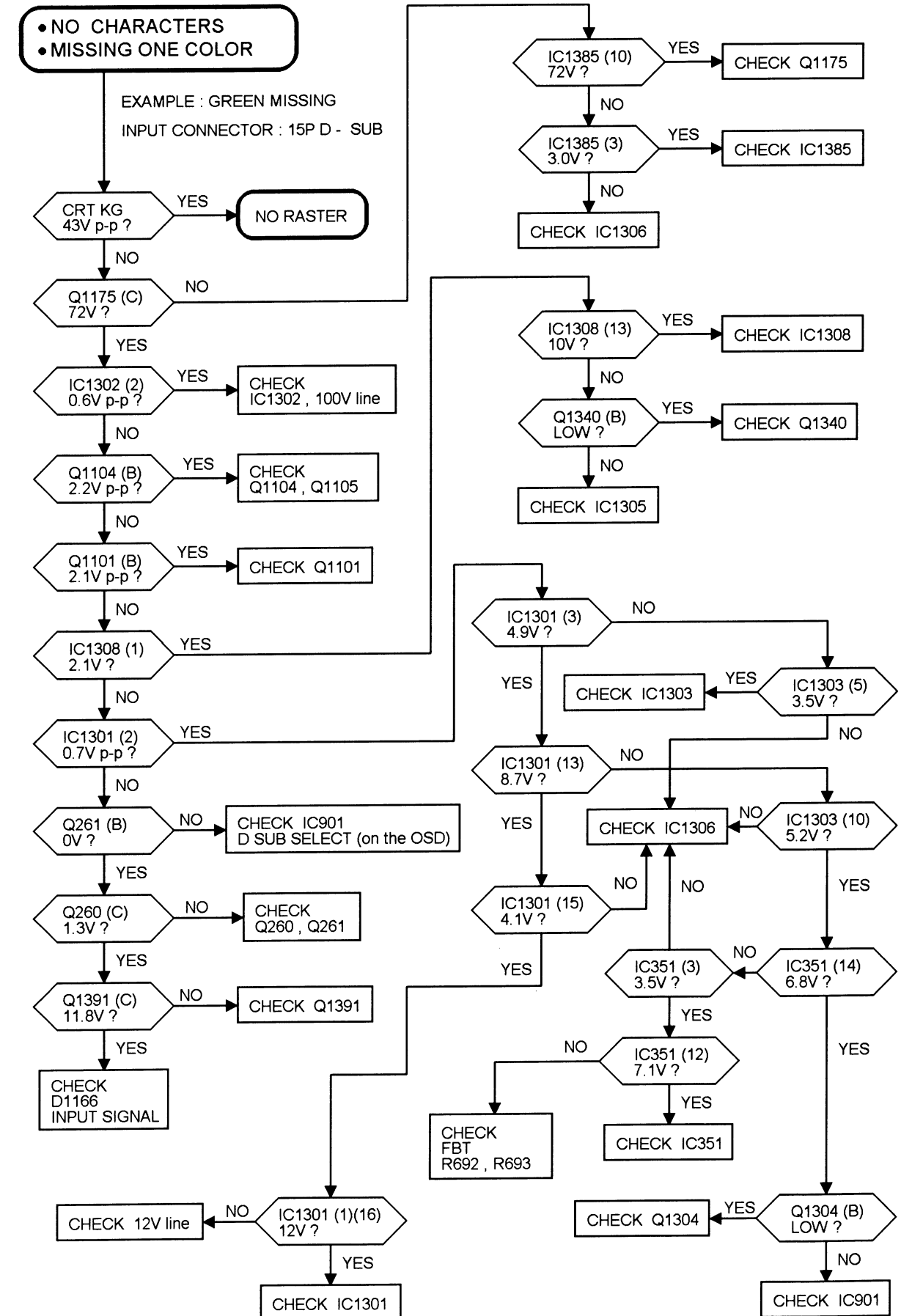
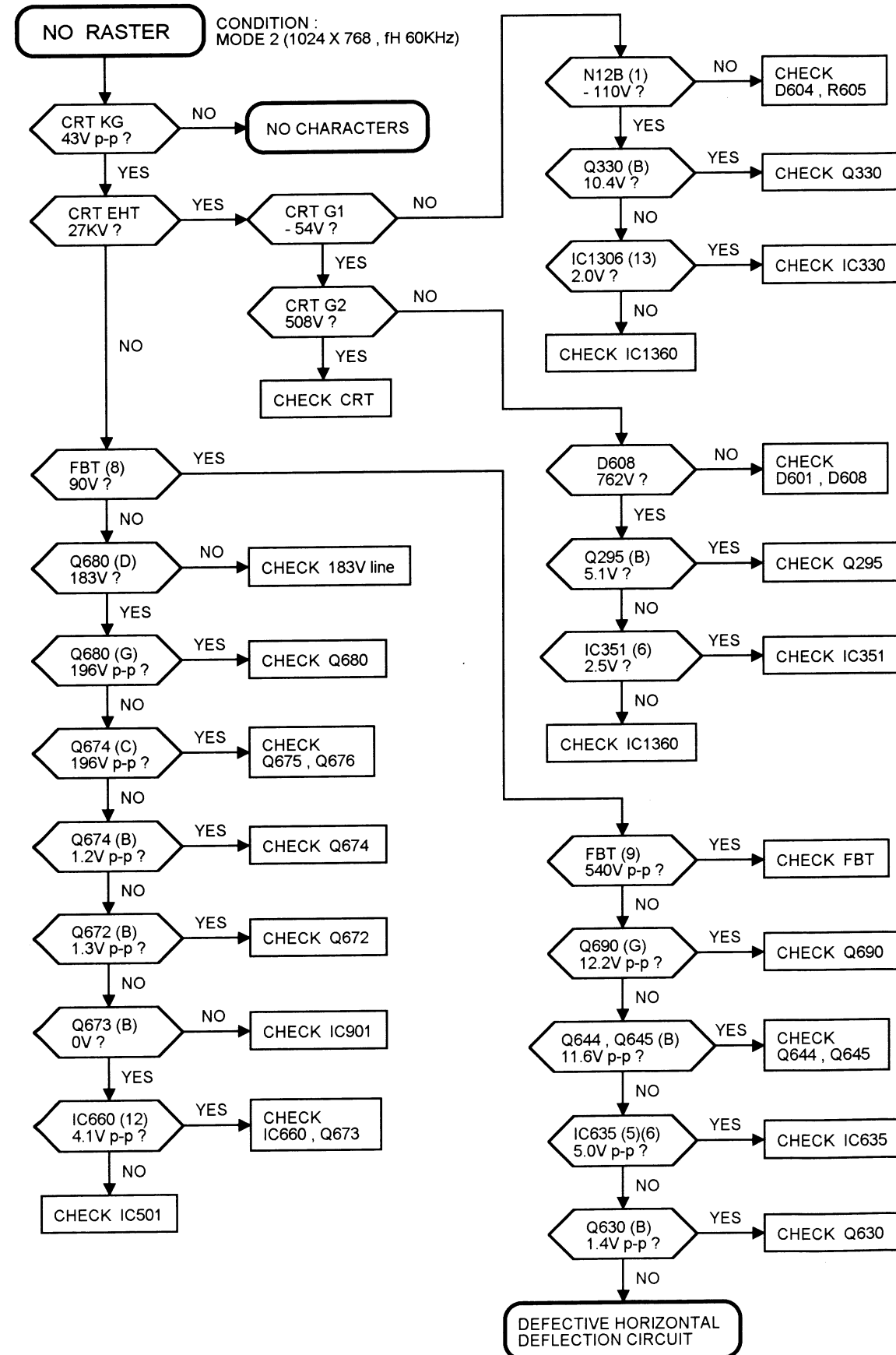




TNP890532 ▲

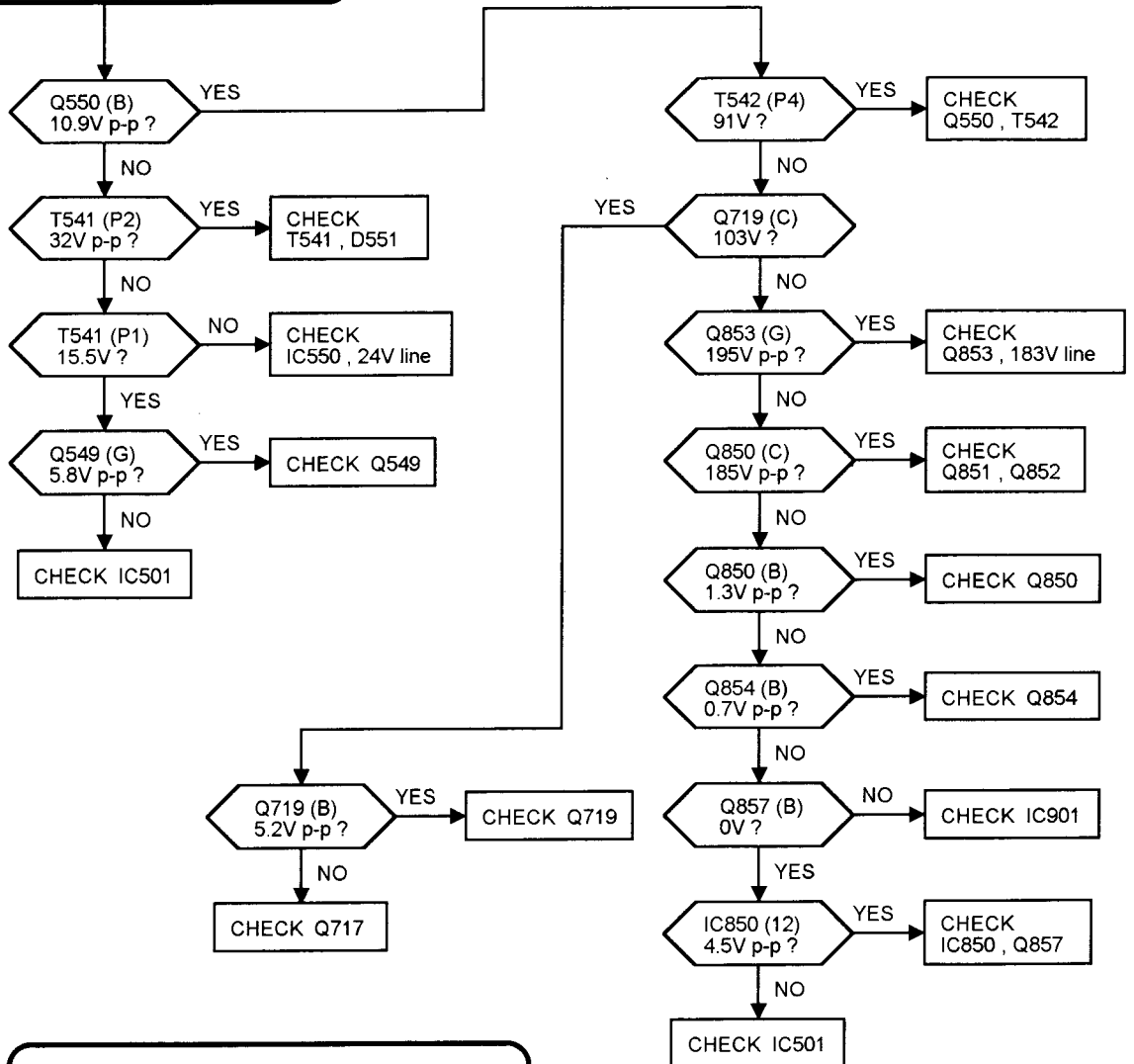


TROUBLE SHOOTING HINTS

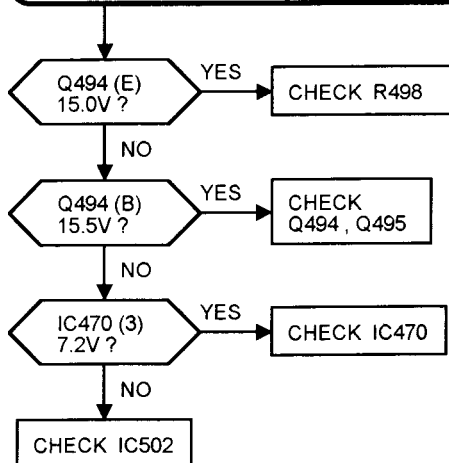


DEFECTIVE HORIZONTAL DEFLECTION CIRCUIT

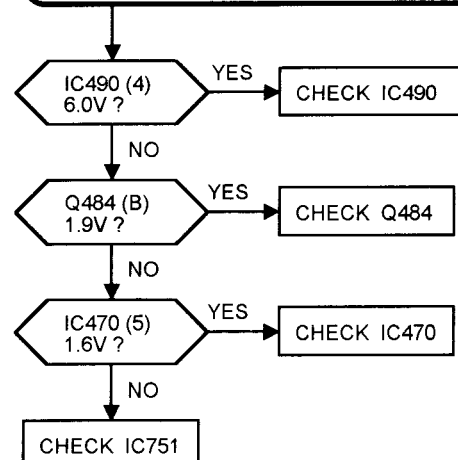
CONDITION : MODE 2 (1024 X 768 , fH 60KHz)

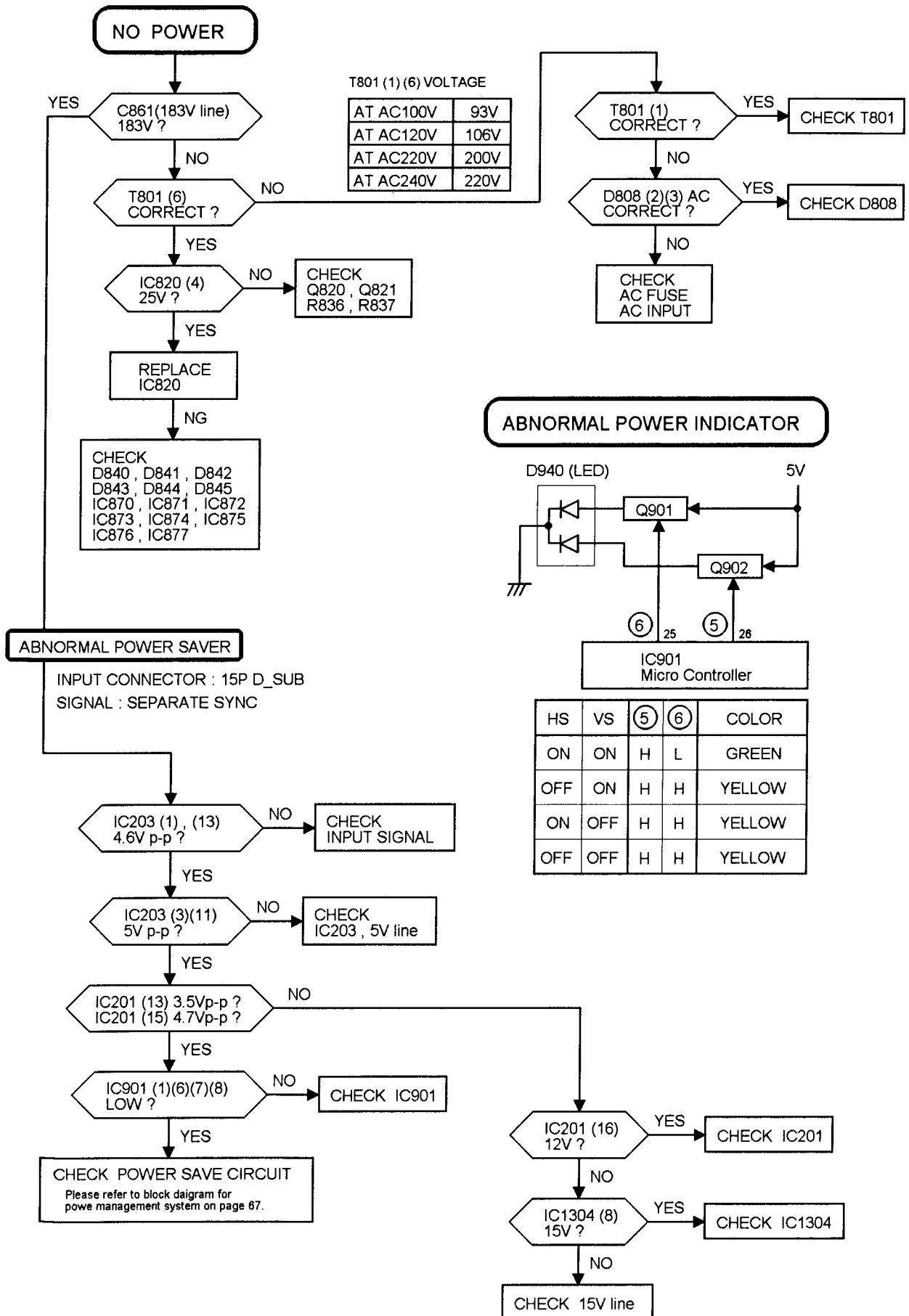


INCORRECT V. POSITION CONTROL



INCORRECT V. SIZE CONTROL

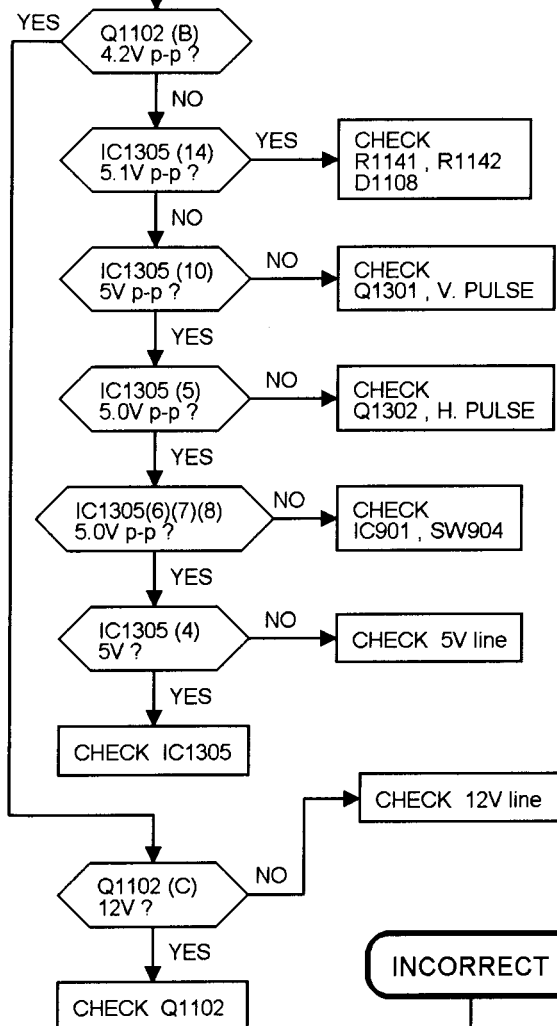




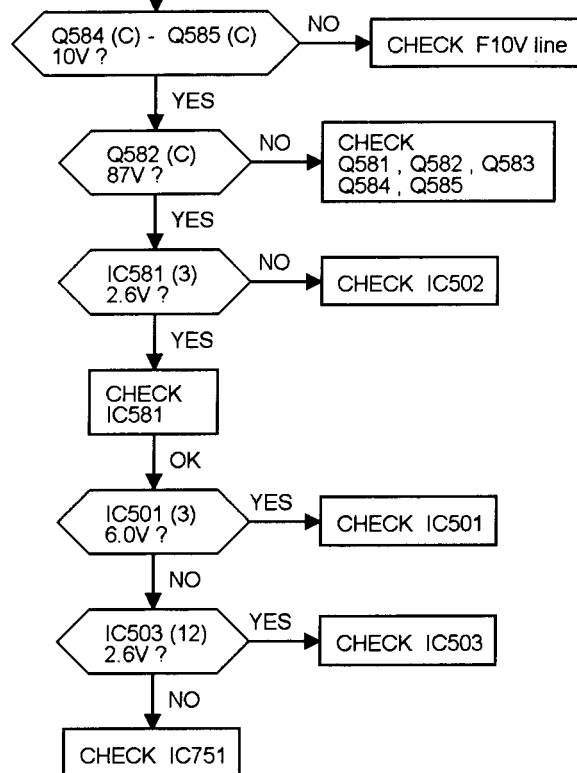
O.S.D. DOES NOT WORK

Please refer to block diagram for O.S.D. operation on page 68.

CONDITION : TURN OFF THE R.G.B. SIGNALS
EXAMPLE : MISSING GREEN

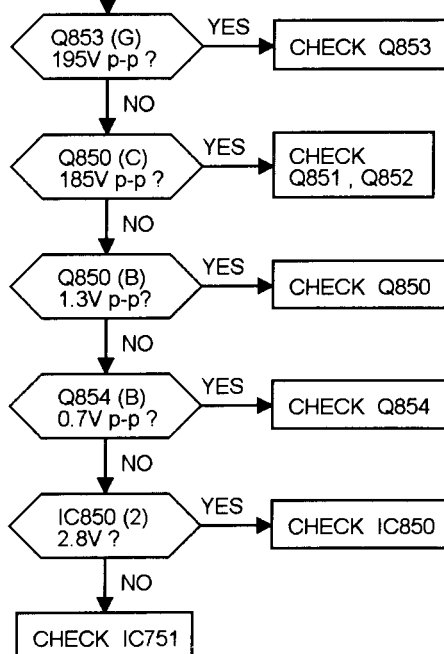


INCORRECT H. POSITION CONTROL



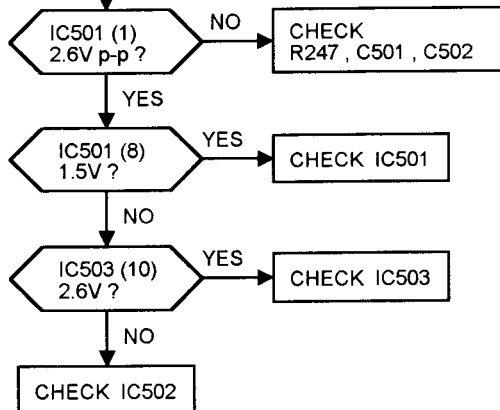
INCORRECT H. SIZE CONTROL

CONDITION :
MODE 2 (1024 X 768, FH 60KHz)



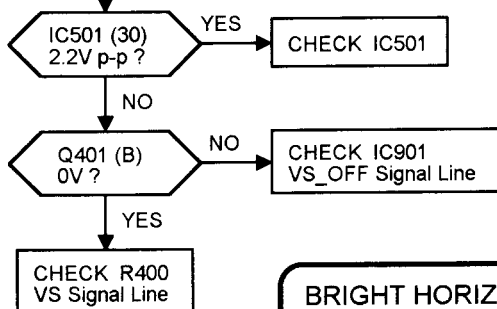
If no horizontal sync from PC, then the power save circuit becomes active.

H. SYNC DOES NOT HOLD

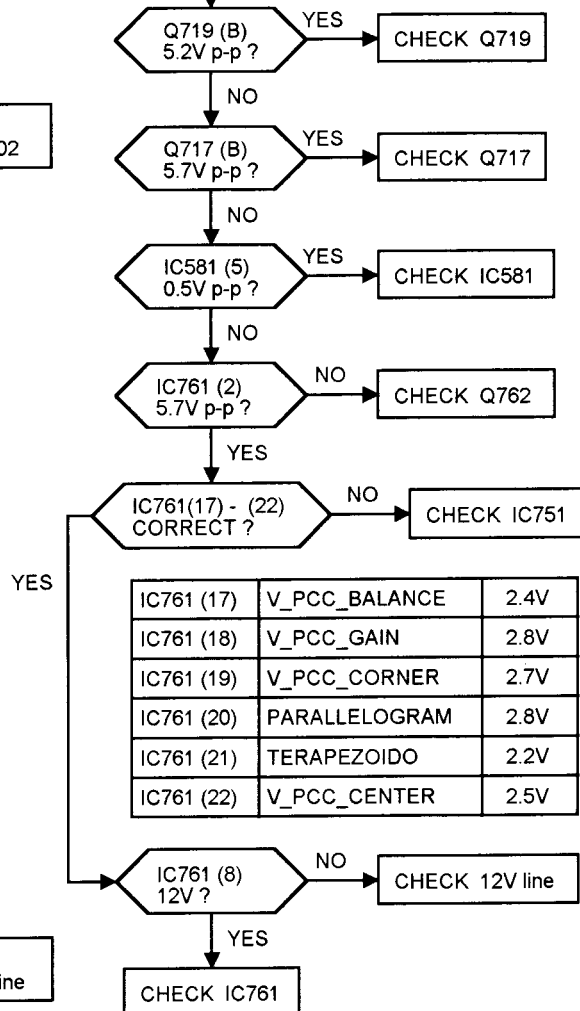


If no vertical sync from PC, then the power save circuit becomes active.

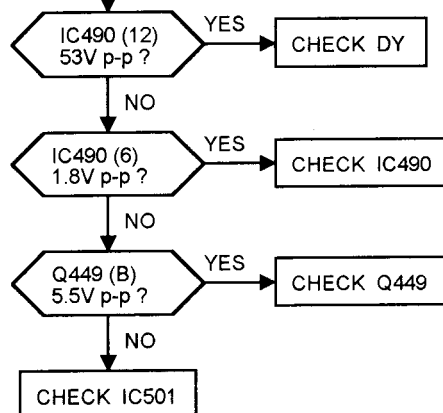
V. SYNC DOES NOT HOLD



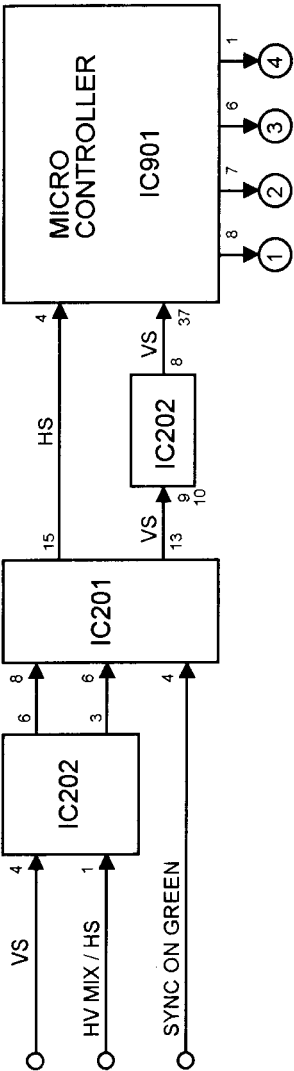
INCORRECT V.PCC



BRIGHT HORIZONTAL LINE APPEARS ON THE SCREEN

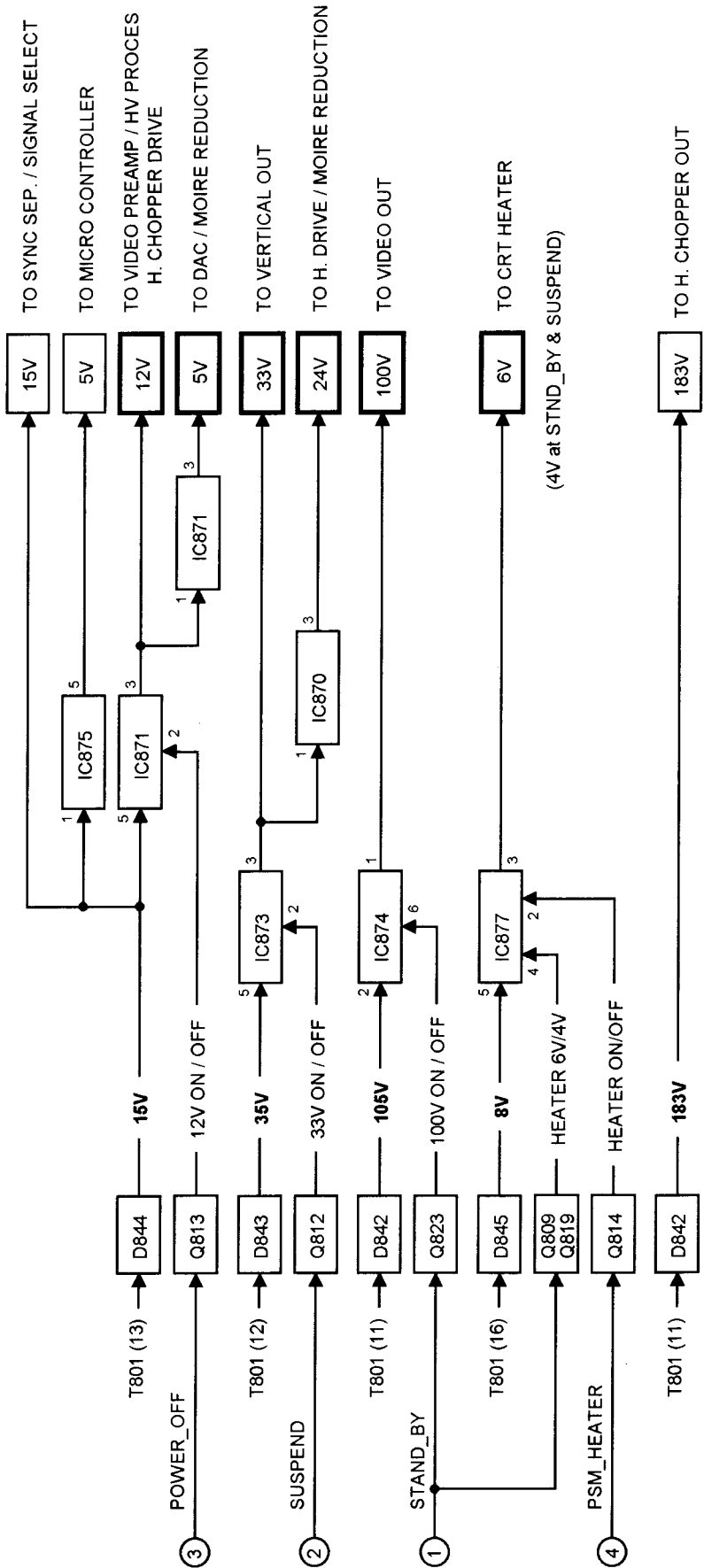


POWER SAVE MANAGEMENT

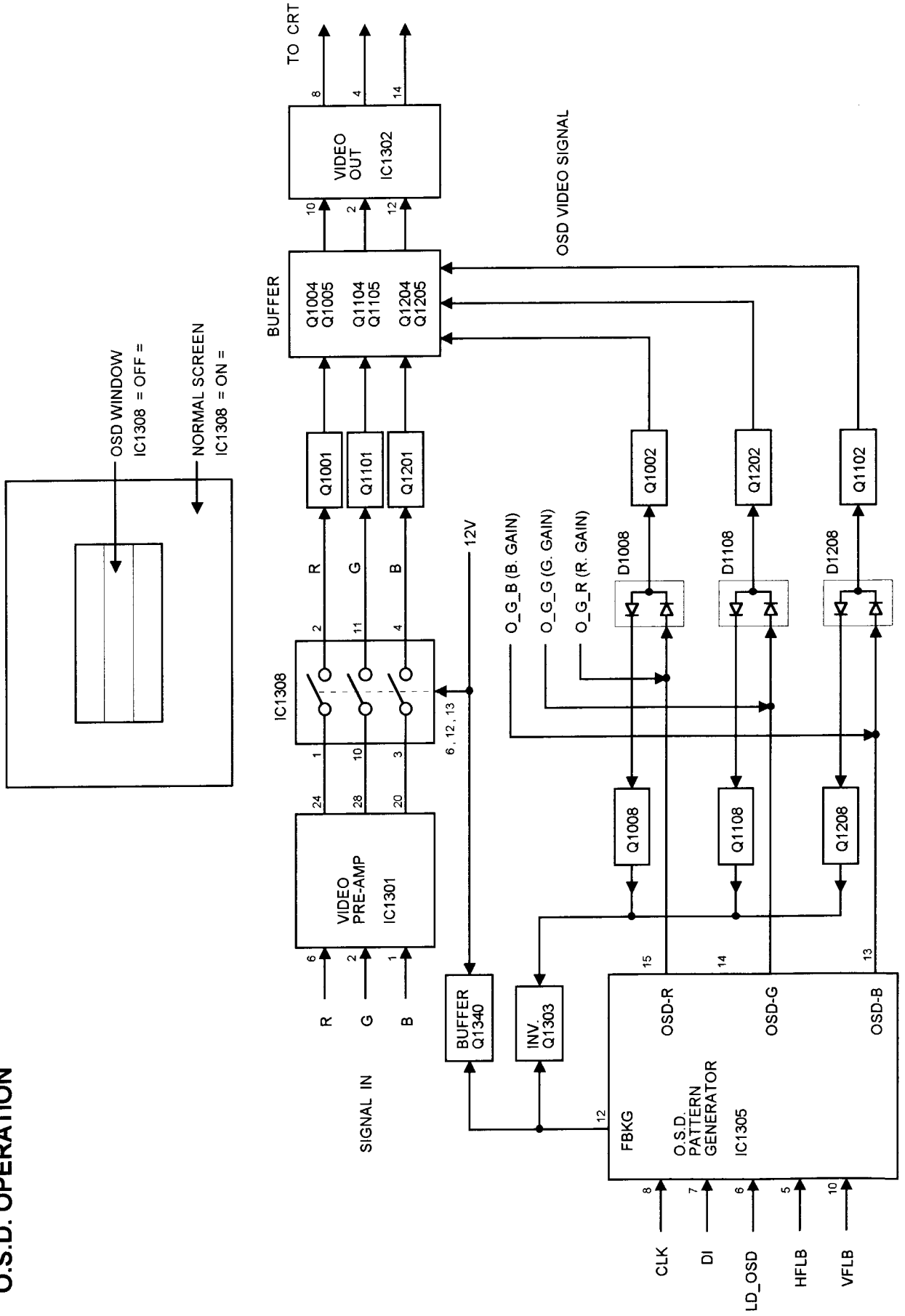


HS	VS	①	②	③	④	100V LINE	33V LINE	24V LINE	12V LINE	6V LINE
ON	ON	L	L	L	L	100V	28.5V	24V	12V	6V
OFF	ON	H	H	L	L	0V	0V	0V	12V	4V
ON	OFF	H	H	L	L	0V	0V	0V	12V	4V
OFF	OFF	H	H	H	H	0V	0V	0V	0V	0V

□ = CONTROLLED BY P.S.M.




O.S.D. OPERATION



	Ref.No.	Part No.	Description		Ref.No.	Part No.	Description
⚠	35	MEY6951THB2	DEFLECTION YOKE		IC470	LM358MX	IC
	36	ETC33D53NA	CONVERGENCE COIL		IC476	LM358MX	IC
	37	TLK858007T	TILT COIL		IC490	LA7838	IC
	38	TLK859096A3	DEGAUSS COIL		IC501	LA7860	IC
⚠		TSX8471-1	POWER CORD<NM>		IC502	MB88346BPFTF	IC
		TSX8484	POWER CORD<-G>		IC503	LM324MX	IC
		TSX8492	POWER CORD<-SW>		IC550	AN6531	IC
		TSX8493	POWER CORD<-U>		IC581	LM358MX	IC
⚠		TSX9571	SIGNAL CORD<-G, -SW>		IC635	LM339MX	IC
		TSX9571-3	SIGNAL CORD<NM, -U>		IC660	TVS1103	IC
		TSX9574-1	1P CONNECTOR CORD		IC751	MB88346BPFTF	IC
	39	TSX9577	FLAT CORD(11P)		IC761	AN5766K-A	IC
⚠	40	TSX9578	FLAT CORD(9P)		IC820	STR-S6533	HYBRID IC
	41	TSX9803	FLAT CORD(7P)		IC850	TVS1103	IC
	42	TSX9990	FLAT CORD(25P)		IC870	M5F7824L	IC
⚠	43	TXAJTC3P1658	3P CONNECTOR ASSY		IC871	SI-3120CA	HYBRID IC
		TXAJTC3P1659	3P CONNECTOR ASSY		IC872	M5F7805L	IC
		TXAJTV3P1657	3P CONNECTOR ASSY		IC873	SI-3240CA	HYBRID IC
		TXA3A12151NM	CRT EARTH LEAD		IC874	STR-S3081	HYBRID IC
⚠		TSN85511	MAGNET		IC875	SI-3090C	HYBRID IC
		T4F31519Q	POLYESTER TAPE(20M)		IC876	L78LR05C	IC
		T4F72425Q	COTTON TAPE(55M)		IC877	SI-3025F	HYBRID IC
		T4F90226-2	MAIRA TAPE(30M)		IC901	TVC80218-1	IC
⚠		TPC8551901	OUTER CARTON<NM>		IC902	24LC08BTISN	IC
		TPC8552401	OUTER CARTON<-G, -SW, -U>		IC904	EXBF5E563J	RR COMBINATION
		TPD353002	PAD		IC1301	M52326SP	IC
		TXAPD2D2131	FILLER		IC1302	VEY09P-Y2	HYBRID IC
⚠		TPE894011	SET COVER<NM, -SW, -U>		IC1303	LM324MX	IC
		TPE894011-1	SET COVER<-G>		IC1304	LM2931CMX	IC
		TQE8513	FUN BAG COVER<-U>		IC1305	MC141540P4	IC
		TQE8513-1	FUN BAG COVER<NM, -G, -SW>		IC1306	MB88346BPFTF	IC
⚠		TQB820247	INSTRUCTION BOOK<NM>		IC1308	MM74HC4066MX	IC
		TQB820261	INSTRUCTION BOOK		IC1385	STK190-050	HYBRID IC
			<-G, -SW, -U>				
		TQD1712010	PASS CARD<-G, -SW, -U>			TRANSISTORS	
⚠		TQD8518073-1	WARRANTY CARD<-U>		Q101	2SD1994AR	TRANSISTOR
		TQF80720	NHW LABEL<NM>		Q102	2SB1322AR	TRANSISTOR
		TQF82880	HIGH VOLTAGE LABEL<NM>		Q103	2SD1994AR	TRANSISTOR
		TQF83825-6	SERIAL NO. LABEL		Q104	2SB1322AR	TRANSISTOR
⚠		TQF85363-2	CARTON LABEL<-G>		Q250	XDC114EU	TRANSISTOR
		TQF85363-3	CARTON LABEL<-SW>		Q251	XDA114EU	TRANSISTOR
		TQF85363-4	CARTON LABEL<-U>		Q260	XDA114EU	TRANSISTOR
		TQF86550	EARTH CAUTION LABEL<-SW>		Q261	XDC114EU	TRANSISTOR
⚠		TQF86555	AC-IN LABEL<-U>		Q295	2SC4632RB7LB	TRANSISTOR
		TQF86574	US PATENTS LABEL<NM>		Q299	2SC3938R	TRANSISTOR
		TQF86583-1	POWER CORD LABEL<-U>		Q301	2SD1819AQ	TRANSISTOR
		TQF86608	EARTH CAUTION LABEL		Q302	2SD1819AQ	TRANSISTOR
⚠			<NM, -G>		Q304	2SC4943RB7LB	TRANSISTOR
		I. C			Q305	2SA1872RB7LB	TRANSISTOR
					Q306	2SA1872RB7LB	TRANSISTOR
⚠	IC101	LM324MX	IC		Q307	2SC4943RB7LB	TRANSISTOR
	IC201	M52346SP	IC		Q319	2SC4620V25	TRANSISTOR
	IC203	MM74HCTOOMX	IC		Q321	XDC114EU	TRANSISTOR
	IC204	MM74HC00MX	IC		Q330	2SB1220R	TRANSISTOR
⚠	IC301	TVS1093	IC		Q331	2SB1220R	TRANSISTOR
	IC302	LM837MX	IC		Q332	XDC114EU	TRANSISTOR
	IC330	LM358MX	IC		Q401	XDC114EU	TRANSISTOR
⚠	IC351	LM324MX	IC		Q442	2SC3938R	TRANSISTOR
	IC459	MB88346BPFTF	IC		Q449	XDC114EU	TRANSISTOR
	IC460	AN5262	IC		Q470	2SD1819AQ	TRANSISTOR
⚠	IC461	AN5262	IC		Q472	2SD1819AQ	TRANSISTOR
	IC462	BX8318A	HYBRID IC		Q484	2SD1819AQ	TRANSISTOR



REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by the International symbol  have special characteristics important for safety. When replacing any of these components use only manufacture's specified parts.



RESISTOR










PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Carbon	F	± 1%
F	Fuse	J	± 5%
M	Metal Oxide	K	± 10%
S	Solid	M	± 20%
W	Wire Wound	G	± 2%

Part No. Description
Example: ERD25TJ104  100K  1/4W

CAPACITOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	C	± 0.25pF
E	Electrolytic	D	± 0.5pF
P	Polyester	F	± 1pF
S	Styrol	J	± 5%
T	Tantalum	K	± 10%
PP	Polypropylene	L	± 15%
		M	± 20%
		P	+100% - 0%
		Z	+80% - 20%

Part No. Description
Example: ECKF1H103ZF  0.01μF  50V

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
	CABINET & MAIN PARTS		24	TES8355	SPRING(CONTROL PANEL)
	1 TKY859103	BOTTOM CABINET		TES8586	EARTH SPRING(SHIELD CASE)
	2 TKE8534A04	ESCUTCHEON<NM>		TES9194-4	SPRING(CRT EARTH)SIDE/TOP
	2 TTE8534A04-3	ESCUTCHEON<-G, -SW, -U>	25	TES9296	SPRING(POWER SWITCH)
	3 TKU894106-1H	REAR COVER W/MODEL PLATE <NM>		TES9532	SPRING(CRT EARTH)R
				TES9533	SPRING(CRT EARTH)L
	3 TKU894106-3H	REAR COVER W/MODEL PLATE <-G>	26	TEK6935	DOOR RATCH
			50	TMM15404-1	SPACER RING
	3 TKU894106-4H	REAR COVER W/MODEL PLATE <-SW>		TMM16452	TILT COIL CLAMPER
	3 TKU894106-5H	REAR COVER W/MODEL PLATE <-U>	49	TMM7464	DEGAUSS COIL CLAMPER
				TMM7468	CLAMPER
	4 TKX865201	SPACER RING	27	TMM81416	CORD BAND(SMALL)
	5 TKX866401-1	CONTROL PANEL HOLDER	28	TMM81489	CARD SPACER
	6 TKX866901	CONTROL PANEL	29	TMM81499	PUSH RIVET
	7 TKX867001	MAIN PC BOARD HOLDER		TMM85475	CLAMPER(BIG)
				TMM85490	LEAD CLAMPER
	8 TKX904902-1	CRT PCB HOLDER		TMM85576-1	CRT RUBBER
	9 TTK859313	LED GUIDE		TMM85586	RUBBER(WEDGE)
	10 TTK859740	PANEL COVER		TMK84990	SET LEG
	11 TTK859958-2	PEDESTAL		TMK85504	HOLDER(R)ITC
	12 TTK859961	CENTER POST		TMK85505	HOLDER(L)ITC
				TMK85572	FERRITE STICK
	13 TUX86189	BOTTOM PLATE	30	THT1028	SCREW(FOR CRT)
	14 TUX87719	PCB BRACKET(H-OUT)	45	XTN5+16A	SCREW
	15 TUX87720	PCB BRACKET(VIDEO)	44	XTN5+25A	SCREW
	16 TUC86975	SHIELD CASE(CRT)			
	17 TUC87570	SHIELD CASE	48	XTV3+10A	SCREW
			46	XTV3+20J	SCREW
	18 TUC87571	SHIELD CASE(REAR)		XTV3+8G	SCREW
	19 TUC87572	SHIELD CASE(CRT PCB)	47	XYA4+EF8	SCREW
	20 TUC87573	SHIELD PLATE(CRT PCB)	21	XYE3+EJ10	SCREW
	TBM850519	MODEL PLATE<NM>			
	TBM850535	MODEL PLATE<-G>	31	M51KYY140X	PICTURE TUBE
			32	TNP800962-21	PC BOARD W/COMPONENT (VIDEO-INPUT/CRT)
	TBM850536-1	MODEL PLATE<-SW>	33	TNP800963-21	PC BOARD W/COMPONENT (H-OUT/KBD/SW/LED)
	TBM850537-1	MODEL PLATE<-U>			
	22 TBX8586508	KNOB(POWER SWITCH)	34	TNP890532-21	PC BOARD W/COMPONENT (MAIN)
	23 TBX8752101	KNOB(CONTROL)			

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
Q494	2SD1994AQ	TRANSISTOR	Q1102	2SC3938R	TRANSISTOR
Q495	2SB1413R	TRANSISTOR	Q1104	2SC4453	TRANSISTOR
Q549	2SK2015	TRANSISTOR	Q1105	2SA1764	TRANSISTOR
Q550	2SC4288ARL	TRANSISTOR	Q1108	2SC3938R	TRANSISTOR
Q560	XDC114EU	TRANSISTOR	Q1175	2SC1473QNC	TRANSISTOR
Q561	2SK2255F122	TRANSISTOR	Q1201	2SC4453	TRANSISTOR
Q562	XDC114EU	TRANSISTOR	Q1202	2SC3938R	TRANSISTOR
Q563	2SK2255F122	TRANSISTOR	Q1204	2SC4453	TRANSISTOR
Q564	XDC114EU	TRANSISTOR	Q1205	2SA1764	TRANSISTOR
Q565	2SK2255F122	TRANSISTOR	Q1208	2SC3938R	TRANSISTOR
Q571	2SD1819AQ	TRANSISTOR	Q1275	2SC1473QNC	TRANSISTOR
Q581	2SB1546P	TRANSISTOR	Q1301	XDC114EU	TRANSISTOR
Q582	2SB1546P	TRANSISTOR	Q1302	XDC114EU	TRANSISTOR
Q583	2SC4212H	TRANSISTOR	Q1303	2SC3938R	TRANSISTOR
Q584	2SD2133S	TRANSISTOR	Q1304	XDC114EU	TRANSISTOR
Q585	2SB1413S	TRANSISTOR	Q1340	2SA1764	TRANSISTOR
Q630	2SC3938R	TRANSISTOR	Q1381	XDA114EU	TRANSISTOR
Q644	2SD1820AR	TRANSISTOR	Q1390	2SA1309AQ	TRANSISTOR
Q645	2SB1219Q	TRANSISTOR	Q1391	XDA114EU	TRANSISTOR
Q672	2SC3938R	TRANSISTOR	Q1392	XDC114EU	TRANSISTOR
Q673	XDC114EU	TRANSISTOR		DIODES	
Q674	2SC4212H	TRANSISTOR	D204	MA142K	DIODE
Q675	2SD874AR	TRANSISTOR	D205	MA8056M	DIODE
Q676	2SB766AQ	TRANSISTOR	D207	MA8051M	DIODE
Q680	IRFI634G	TRANSISTOR	D242	MA8056M	DIODE
Q690	IRFPF50	TRANSISTOR	D243	MA142K	DIODE
Q717	2SC1473QNC	TRANSISTOR	D245	MA142K	DIODE
Q719	2SD1641	TRANSISTOR	D246	MA142K	DIODE
Q762	XDC114EU	TRANSISTOR	D247	MA142K	DIODE
Q805	2SB1220R	TRANSISTOR	D250	MA8056M	DIODE
Q809	2SC3938R	TRANSISTOR	D251	MA8056M	DIODE
Q810	2SD814AQ	TRANSISTOR	D252	MA8056M	DIODE
Q811	XDC114EU	TRANSISTOR	D253	MA8056M	DIODE
Q812	XDC114EU	TRANSISTOR	D254	MA8056M	DIODE
Q813	XDC114EU	TRANSISTOR	D255	MA111	DIODE
Q814	XDC114EU	TRANSISTOR	D256	MA8047M	DIODE
Q815	2SB1220R	TRANSISTOR	D302	MA8082L	DIODE
Q816	XDC114EU	TRANSISTOR	D303	MA142K	DIODE
Q820	2SC4620V25	TRANSISTOR	D304	MA111	DIODE
Q821	2SD1992AR	TRANSISTOR	D330	HZT33-09TD	DIODE
Q822	2SC4620V25	TRANSISTOR	D331	HZT33-09TD	DIODE
Q823	2SD814AQ	TRANSISTOR	D334	MA28T-A	DIODE
Q824	2SD1820AR	TRANSISTOR	D337	EU02Z	DIODE
Q825	2SB1220R	TRANSISTOR	D338	EU02Z	DIODE
Q850	2SC4212H	TRANSISTOR	D353	MA8150M	DIODE
Q851	2SD874AR	TRANSISTOR	D371	MA8062L	DIODE
Q852	2SB766AQ	TRANSISTOR	D381	TAX125X103MA	VARISTOR
Q853	IRFI634G	TRANSISTOR	D382	ERZC05DK201U	VARISTOR
Q854	2SC3938R	TRANSISTOR	D441	MA111	DIODE
Q855	XDC114EU	TRANSISTOR	D443	MA8270M	DIODE
Q856	XDC114EU	TRANSISTOR	D445	MA111	DIODE
Q857	XDC114EU	TRANSISTOR	D446	MA111	DIODE
Q901	XDA114EU	TRANSISTOR	D447	MA111	DIODE
Q902	XDA114EU	TRANSISTOR	D449	MA8056M	DIODE
Q903	XDC114EU	TRANSISTOR	D482	MA728	DIODE
Q1001	2SC4453	TRANSISTOR	D485	TVSRD18EB2	DIODE
Q1002	2SC3938R	TRANSISTOR	D486	ERA1502	DIODE
Q1004	2SC4453	TRANSISTOR	D488	TVSRD10FB2	DIODE
Q1005	2SA1764	TRANSISTOR	D489	MA1360M	DIODE
Q1008	2SC3938R	TRANSISTOR	D497	MA30WA	DIODE
Q1075	2SC1473QNC	TRANSISTOR	D502	MA728	DIODE
Q1101	2SC4453	TRANSISTOR			

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
D539	MA8047M	DIODE	D875	MA8360H	DIODE
D550	FMP-G3FSLF	DIODE	D876	MA8360H	DIODE
D551	ERA81004	DIODE	D877	MA8150M	DIODE
D552	MA111	DIODE	D901	MA111	DIODE
D553	MA8150M	DIODE	D902	MA8047M	DIODE
D571	MA111	DIODE	D905	MA8056M	DIODE
D581	MA142K	DIODE	D907	MA8056M	DIODE
D601	RU1P	DIODE	D912	MA8056M	DIODE
D602	MA167	DIODE	D913	MA8056M	DIODE
D604	EU02Z	DIODE	D914	MA8056M	DIODE
D606	MA111	DIODE	D915	MA8056M	DIODE
D608	RU1P	DIODE	D940	GL8ED5	DIODE (LED)
D610	RD82P	DIODE	D941	1SS133	DIODE
D611	RD82P	DIODE	D942	1SS133	DIODE
D635	MA8150M	DIODE	D946	MA142WK	DIODE
D652	MA8051M	DIODE	D947	MA8056M	DIODE
D661	MA8150M	DIODE	D950	MA8056M	DIODE
D662	MA8130H	DIODE	D951	MA8056M	DIODE
D666	MA111	DIODE	D953	MA8056M	DIODE
D667	MA111	DIODE	D954	MA8056M	DIODE
D668	MA111	DIODE	D955	MA8056M	DIODE
D669	MA111	DIODE	D956	MA8056M	DIODE
D672	MA30A	DIODE	D957	MA8056M	DIODE
D674	ERA18-O4	DIODE	D958	MA8056M	DIODE
D680	MA8150M	DIODE	D960	MA8056M	DIODE
D681	CB903-4	DIODE	D961	MA8056M	DIODE
D690	MA8200H	DIODE	D962	MA8056M	DIODE
D695	MA4130H	DIODE	D963	MA8056M	DIODE
D714	MA142K	DIODE	D1001	DCC010	DIODE
D715	MA143A	DIODE	D1006	MA199	DIODE
D716	MA142K	DIODE	D1007	MA199	DIODE
D717	MA28T-A	DIODE	D1008	MA147	DIODE
D719	EMO1Z	DIODE	D1054	MA142K	DIODE
△ D801	ERZVEAV431	VARISTOR	D1055	MA142K	DIODE
△ D803	ERZVEAV431	VARISTOR	D1057	MA142K	DIODE
D804	SM3JZ47LB181	DIODE	D1058	MA142K	DIODE
D807	EG01Z	DIODE	D1064	MA142K	DIODE
D808	RBV406M	DIODE	D1066	MA142K	DIODE
D809	MA111	DIODE	D1075	MA167A	DIODE
D810	MA8240M	DIODE	D1101	DCC010	DIODE
D817	MA8200L	DIODE	D1106	MA199	DIODE
D821	RG2A2	DIODE	D1107	MA199	DIODE
D840	ERB93-O2	DIODE	D1108	MA147	DIODE
D841	ESAC39M06ES	DIODE	D1154	MA142K	DIODE
D842	ERC3806	DIODE	D1155	MA142K	DIODE
D843	CB903-4	DIODE	D1157	MA142K	DIODE
D844	RL4Z	DIODE	D1158	MA142K	DIODE
D845	ERC9102L	DIODE	D1164	MA142K	DIODE
D846	MA8068M	DIODE	D1166	MA142K	DIODE
D847	MA8220L	DIODE	D1175	MA167A	DIODE
D850	MA111	DIODE	D1201	DCC010	DIODE
D851	MA111	DIODE	D1206	MA199	DIODE
D852	MA111	DIODE	D1207	MA199	DIODE
D853	ERA18-O4	DIODE	D1208	MA147	DIODE
D854	MA30A	DIODE	D1254	MA142K	DIODE
D855	MA8150M	DIODE	D1255	MA142K	DIODE
D856	CB903-4	DIODE	D1257	MA142K	DIODE
D857	MA8075H	DIODE	D1258	MA142K	DIODE
D871	MA8360M	DIODE	D1264	MA142K	DIODE
D872	MA8360M	DIODE	D1266	MA142K	DIODE
D873	MA8360M	DIODE	D1275	MA167A	DIODE
D874	MA8360H	DIODE	D1303	MA8056M	DIODE

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
D1304	MA8056M	DIODE	T541	TLH85407Z	COIL
D1305	MA8056M	DIODE	T542	TLH85501Z1	COIL
D1306	MA8056M	DIODE	△ T601	ETF42L28AZ	FLYBACK TRANS.
D1307	MA8056M	DIODE	△ T801	ETS42AF135ND	TRANS.
D1311	MA8056M	DIODE			
				CAPACITORS	
D1340	MA8082L	DIODE	C101	ECUX1H103KBG	C 0.01UF K 50V
D1380	HZT33-09TD	DIODE	C106	ECUX1E334ZFW	C 0.33UF Z 25V
D1381	HZT33-09TD	DIODE	C107	ECEA1HGE4R7	E 4.7UF 50V
D1382	HZT33-09TD	DIODE	C108	ECEA1HGE4R7	E 4.7UF 50V
D1383	HZT22	DIODE	C112	ECUX1E334ZFW	C 0.33UF Z 25V
D1385	MA4082NM	DIODE	C201	ECQV1H474JM	P 0.47UF J 50V
D1386	MA8150M	DIODE	C202	ECEA1HGE010	E 1UF 50V
D1395	MA4082NM	DIODE	C203	ECEA1HGE010	E 1UF 50V
D1401	MA111	DIODE	C204	ECUX1H472KBG	C 4700PF K 50V
D1402	MA704	DIODE	C205	ECUX1H103KBG	C 0.01UF K 50V
	COIL & TRANSFORMERS				
L381	TSK8029	FERRITE CORE	C207	ECEA1HGE2R2	E 2.2UF 50V
L383	TSK8029	FERRITE CORE	C208	ECEA1HGE2R2	E 2.2UF 50V
L464	ELEY561KA	PEAKING COIL	C209	ECUX1H333KBX	C 0.033UF K 50V
L521	ELEY470KA	PEAKING COIL	C210	ECUX1H102KBN	C 1000PF K 50V
L550	EXCELSR35S	LC COMBINATION	C211	ECUX1H102KBN	C 1000PF K 50V
L551	EXCELSR35S	LC COMBINATION	C212	ECEA1CGE101	E 100UF 16V
L573	ELHKLBO14B	COIL	C213	ECUX1H102KBN	C 1000PF K 50V
L574	ELHKLBO14B	COIL	C214	ECQV1H474JM	P 0.47UF J 50V
L575	TLH85815T	COIL	C215	ECEA1CGE101	E 100UF 16V
L599	TLUACNB821K	PEAKING COIL	C242	ECUX1H103KBG	C 0.01UF K 50V
L680	EXCELD35C	LC COMBINATION	C243	ECUX1H103KBG	C 0.01UF K 50V
L681	TLP85708R	CHOKE COIL	C244	ECUX1H103KBG	C 0.01UF K 50V
L751	ELEY561KA	PEAKING COIL	C298	ECEA1CGE470	E 47UF 16V
△ L801	ELF18D650C	LINE FILTER	C299	ECUX1H103KBG	C 0.01UF K 50V
△ L802	ELF18D656Z	LINE FILTER	C306	ECEA1CGE470	E 47UF 16V
L806	TSK8031	FERRITE CORE	C308	ECUX1H103KBG	C 0.01UF K 50V
L821	EXCELD35C	LC COMBINATION	C309	ECUX1H103KBG	C 0.01UF K 50V
L822	EXCELD35C	LC COMBINATION	C318	ECKD2H151KB5	C 150PF K 500V
L823	EXCELD35C	LC COMBINATION	C319	ECQV1H473JM	P 0.047UF J 50V
L824	EXCELD35C	LC COMBINATION	C321	ECUX1H104ZFX	C 0.1UF Z 50V
L840	EXCELD35C	LC COMBINATION	C322	ECYX1H332JCW	C 3300PF J 50V
L844	EXCELD35C	LC COMBINATION	C323	ECKD3A102JBP	C 1000PF J 1KV
L845	EXCELD35C	LC COMBINATION	C325	ECKF1H103ZF	C 0.01UF Z 50V
L850	TLP85708R	CHOKE COIL	C326	ECUX1H103KBG	C 0.01UF K 50V
L851	EXCELD35C	LC COMBINATION	C327	ECCF1H150JC	C 15PF J 50V
L852	EXCELD35C	LC COMBINATION	C328	ECUX1H103KBG	C 0.01UF K 50V
L853	EXCELD35C	LC COMBINATION	C329	ECEA1HGE100	E 10UF 50V
L1001	ELEXHR47KA	PEAKING COIL	C330	ECEA1HGE2R2	E 2.2UF 50V
L1051	TSK8031	FERRITE CORE	C331	ECUX1H104ZFX	C 0.1UF Z 50V
L1061	TSK8031	FERRITE CORE	C337	ECUX1H101JCG	C 100PF J 50V
L1101	ELEXHR47KA	PEAKING COIL	C339	ECQE2104KF	P 0.1UF K 200V
L1102	ELJNAR22KB	CHIP COIL	C351	ECUX1H103KBG	C 0.01UF K 50V
L1151	TSK8031	FERRITE CORE	C370	ECUX1H103KBG	C 0.01UF K 50V
L1161	TSK8031	FERRITE CORE	C371	ECEA1CGE101	E 100UF 16V
L1175	TSK8029	FERRITE CORE	C372	ECQB1H223JF	P 0.022UF J 50V
L1201	ELEXHR47KA	PEAKING COIL	C373	ECQB1H333JF	P 0.033UF J 50V
L1251	TSK8031	FERRITE CORE	C374	ECQV1H394JM	P 0.39UF J 50V
L1261	TSK8031	FERRITE CORE	C375	ECEA1CGE330	E 33UF 16V
L1301	ELEXH100KA	PEAKING COIL	C376	ECQV1H154JM	P 0.15UF J 50V
L1302	TLUACNB821K	PEAKING COIL	C377	ECUX1H560JCG	C 56PF J 50V
L1303	EXCELD35C	LC COMBINATION	C378	ECEA1EGN330	E 33UF 25V
L1304	EXCELD35C	LC COMBINATION	C379	ECEA1HGE010	E 1UF 50V
L1305	EXCELD35C	LC COMBINATION	C380	ECUX1H820JCG	C 82PF J 50V
L1306	TSK8029	FERRITE CORE	C381	ECUX1H330JCG	C 33PF J 50V
L1308	ELEXH151KA	PEAKING COIL	C382	ECUX1H103KBG	C 0.01UF K 50V
			C383	ECEA1HGE010	E 1UF 50V

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
C384	ECUX1H560JCG	C 56PF J 50V	C530	ECUX1H151JCG	C 150PF J 50V
C385	ECQB1H563JF	P 0.056UF J 50V	C531	ECUX1H103KBG	C 0.01UF K 50V
C387	ECUX1H103KBG	C 0.01UF K 50V	C532	ECEA1CGE101	E 100UF 16V
C388	ECUX1H103KBG	C 0.01UF K 50V	C533	ECUX1H332KBN	C 3300PF K 50V
C390	ECKD2H101KB5	C 100PF K 500V	C550	ECEA1VGE101	E 100UF 35V
C391	ECEA1HGE100	E 10UF 50V	C551	ECEA1VGE101	E 100UF 35V
C392	ECUX1H102JCX	C 1000PF J 50V	C552	ECKD2H332KB5	C 3300PF K 500V
C393	ECKD3D272KBP	C 2700PF K 2KV	C553	ECWH15H222HN	PP 2200PF H 1.5KV
C394	ECQE10473KF	P 0.047UF K 1KV	C554	ECWH15H222HN	PP 2200PF H 1.5KV
C395	ECUX1H102KBN	C 1000PF K 50V	C555	ECQE2335KF	P 3.3UF K 200V
C401	ECUX1H220JCN	C 22PF J 50V	C561	ECWF2H125HDB	PP 1.2UF H 500V
C402	ECEA1HGE010	E 1UF 50V	C563	ECWF2H364HDB	PP 0.36UF H 200V
C403	ECQV1H104JM	P 0.1UF J 50V	C565	ECWF2H184HDP	PP 0.18UF H 500V
C404	ECQB1H123JF	P 0.012UF J 50V	C568	ECWF4304HBP	PP 0.3UF H 400V
C405	ECUX1H102KBN	C 1000PF K 50V	C573	ECKD2H102KB5	C 1000PF K 500V
C442	ECUX1H221KBN	C 220PF K 50V	C574	ECKD2H102KB5	C 1000PF K 500V
C459	ECEA0JGE471	E 470UF 6.3V	C575	ECUX1C474ZFX	C 0.47UF Z 16V
C460	ECEA1CGE470	E 47UF 16V	C576	ECUX1C474ZFX	C 0.47UF Z 16V
C461	ECEA1HGE330	E 33UF 50V	C577	ECUX1C474ZFX	C 0.47UF Z 16V
C462	ECEA1HGE330	E 33UF 50V	C580	ECEA1EGE101	E 100UF 25V
C463	ECEA1HGE330	E 33UF 50V	C581	ECQE2224KF	P 0.22UF K 200V
C464	ECEA1CGE330	E 33UF 16V	C582	ECUX1H103KBG	C 0.01UF K 50V
C465	ECUX1H222KBN	C 2200PF K 50V	C583	ECUX1C105ZFW	C 1.0UF Z 16V
C466	ECEA1CGE330	E 33UF 16V	C584	ECUX1C105ZFW	C 1.0UF Z 16V
C467	ECA1VEN330	E 33UF 35V	C599	ECEA1HGN100	E 10UF 50V
C468	ECEA1CGE100	E 10UF 16V	C601	ECEA2AGE220	E 22UF 100V
C469	ECEA1CGE470	E 47UF 16V	C603	ECEA2CGE220	E 22UF 160V
C470	ECUX1H103KBG	C 0.01UF K 50V	C604	ECEA1HGE010	E 1UF 50V
C471	ECUX1H103KBG	C 0.01UF K 50V	C605	ECEA2EGE3R3	E 3.3UF 250V
C476	ECUX1H103KBG	C 0.01UF K 50V	C606	ECEA2GGE4R7	E 4.7UF 400V
C479	ECEA1AGE101	E 100UF 10V	C609	ECEA2CGE2R2	E 2.2UF 160V
C480	ECEA1CGE471	E 470UF 16V	C610	ECEA2GGE4R7	E 4.7UF 400V
C482	ECEA1VGE4R7	E 4.7UF 35V	C634	ECUX1H272KBN	C 2700PF K 50V
C483	ECQV1H124JM	P 0.12UF J 50V	C635	ECUX1H103KBG	C 0.01UF K 50V
C484	ECHU1H473JB9	P 0.047UF J 50V	C638	ECUX1H103KBG	C 0.01UF K 50V
C485	ECEA1HGE222	E 2200UF 50V	C660	ECEA1VGE470	E 47UF 35V
C488	ECQV1J183JM	P 0.018UF J 63V	C661	ECQB1H562JF	P 5600PF J 50V
C490	ECA1EXS330	E 33UF 25V	C662	ECUX1H104ZFX	C 0.1UF Z 50V
C491	ECEA1VGE222	E 2200UF 35V	C663	ECUX1H104ZFX	C 0.1UF Z 50V
C492	ECA1HFQ101	E 100UF 50V	C664	ECUX1H102JCX	C 1000PF J 50V
C497	ECEA1VGE101	E 100UF 35V	C665	ECUX1H121JCG	C 120PF J 50V
C498	ECEA1VGE101	E 100UF 35V	C666	ECUX1H102JCX	C 1000PF J 50V
C501	ECUX1H470JCG	C 47PF J 50V	C667	ECUX1H221JCG	C 220PF J 50V
C502	ECUX1H103KBG	C 0.01UF K 50V	C668	ECUX1H123KBX	C 0.012UF K 50V
C504	ECUX1H103KBG	C 0.01UF K 50V	C672	ECA1VXS4R7	E 4.7UF 35V
C506	ECUX1H103KBG	C 0.01UF K 50V	C674	ECEA1VGE470	E 47UF 35V
C507	ECEA1HGN4R7	E 4.7UF 50V	C679	ECA1JFQ120	E 12UF 63V
C509	ECUX1H681JCX	C 680PF J 50V	C681	ECQE2335KF	P 3.3UF K 200V
C510	ECYX1H122JCX	C 1200PF J 50V	C685	ECKD3A221KBP	C 220PF K 1KV
C511	ECEA1HGE4R7	E 4.7UF 50V	C686	ECKD3A221KBP	C 220PF K 1KV
C512	ECUX1H271KBN	C 270PF K 50V	C690	ECWH12H222HS	PP 2200PF H 1.2KV
C514	ECUX1H103KBG	C 0.01UF K 50V	C691	ECKD3D391JBP	C 390PF J 2KV
C515	ECHU1H122GB5	P 1200PF G 50V	C693	TACD1H471KBT	C 470PF K 50V
C516	ECUX1H151JCG	C 150PF J 50V	C694	ECUX1H682KBG	C 6800PF K 50V
C517	ECEA1HGE2R2	E 2.2UF 50V	C695	ECKD2H221KB5	C 220PF K 500V
C518	ECEA1HGE2R2	E 2.2UF 50V	C696	ECQB1H102JF	P 1000PF J 50V
C519	ECUX1H561JCX	C 560PF J 50V	C697	ECEA1HGE470	E 47UF 50V
C520	ECEA1CGE102	E 1000UF 16V	C698	ECEA1HGE4R7	E 4.7UF 50V
C521	ECEA0JGE471	E 470UF 6.3V	C709	ECEA1HGN100	E 10UF 50V
C522	ECUX1H103KBG	C 0.01UF K 50V	C712	ECUX1H103KBG	C 0.01UF K 50V
C523	ECUX1H103KBG	C 0.01UF K 50V	C715	ECEA2CGE4R7	E 4.7UF 160V
C526	ECEA1HGE3R3	E 3.3UF 50V	C718	ECUX1H103KBG	C 0.01UF K 50V

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
C719	ECQE2103KF	P 0.01UF K 200V	C886	ECEA1HGE470	E 47UF 50V
C720	ECQE2103KF	P 0.01UF K 200V	C887	ECA1VXS4R7	E 4.7UF 35V
C752	ECUX1H103KBG	C 0.01UF K 50V	C888	ECEA2AGE100	E 10UF 100V
C754	ECEAOJGE471	E 470UF 6.3V	C889	ECA2DGE680Y	E 68UF 200V
C755	ECEA1CGE100	E 10UF 16V	C891	ECQE4103KF	P 0.01UF K 400V
C770	ECEA1HGE330	E 33UF 50V	C892	ECKD3D151JBP	C 150PF J 2KV
C772	ECUX1C105ZFW	C 1.0UF Z 16V	C893	ECUX1H104ZFX	C 0.1UF Z 50V
C773	ECEA1HGN4R7	E 4.7UF 50V	C895	ECEA1HGE010	E 1UF 50V
C774	ECA1HXS4R7	E 0.47UF 50V	C896	ECUX1H103KBG	C 0.01UF K 50V
C775	ECUX1H103KBG	C 0.01UF K 50V	C901	ECUX1H220JCN	C 22PF J 50V
C776	ECEA1CGE101	E 100UF 16V	C902	ECEA1AGE101	E 100UF 10V
C777	ECEA1VGE470	E 47UF 35V	C903	ECUX1H103KBG	C 0.01UF K 50V
C799	ECEA1CGN470	E 47UF 16V	C904	ECUX1H103KBG	C 0.01UF K 50V
△ C801	ECQU2A105MVZ	PP 1.0UF M 250V	C905	ECUX1H103KBG	C 0.01UF K 50V
△ C802	ECKDRS222ME	C 2200PF M	C906	ECUX1H103KBG	C 0.01UF K 50V
△ C803	ECKDRS222ME	C 2200PF M	C907	ECUX1H221KBN	C 220PF K 50V
△ C805	ECQU2A105MVZ	PP 1.0UF M 250V	C908	ECUX1H150JCN	C 15PF J 50V
C814	ECWF4105JZ	PP 1.0UF J 400V	C909	ECUX1H150JCN	C 15PF J 50V
C815	ECQE4104JF	P 0.1UF J 400V	C910	ECUX1H221KBN	C 220PF K 50V
C819	ECKD3A101KBP	C 100PF K 1KV	C911	ECUX1H221KBN	C 220PF K 50V
C820	ECUX1H223KBX	C 0.022UF K 50V	C912	ECUX1H333KBX	C 0.033UF K 50V
C821	ECQE6473KF	P 0.047UF K 600V	C1002	ECEA1CGE470	E 47UF 16V
C822	ECUX1H222KBN	C 2200PF K 50V	C1003	ECUX1H103KBG	C 0.01UF K 50V
C823	ECEA1HGE4R7	E 4.7UF 50V	C1004	ECUX1H103KBG	C 0.01UF K 50V
C824	ECEA1HGE100	E 10UF 50V	C1005	ECQV1H105JM	P 1.0UF J 50V
C825	ECEA1HGE3R3	E 3.3UF 50V	C1006	ECUX1H750JCG	C 75PF J 50V
C827	ECUX1H681KBN	C 680PF K 50V	C1008	ECEA2DGE100	E 10UF 200V
C828	ECEA1HGE470	E 47UF 50V	C1009	ECUX1H103KBG	C 0.01UF K 50V
C829	ECEA1VGE221	E 220UF 35V	C1010	ECKD2H102KB5	C 1000PF K 500V
△ C831	ECKDRS472ME	C 4700PF M	C1013	ECUX1H390JCG	C 39PF J 50V
△ C832	ECKDRS472ME	C 4700PF M	C1014	ECQV1474JZ	P 0.47UF J 100V
C839	ECEAOJGE102	E 1000UF 6.3V	C1015	TACCG681P200	C 680PF 200V
C840	ECEA1HGE4R7	E 4.7UF 50V	C1030	ECUX1H220JCN	C 22PF J 50V
C841	ECUX1C105ZFW	C 1.0UF Z 16V	C1040	ECUX1C105ZFW	C 1.0UF Z 16V
C842	ECKD3D151JBP	C 150PF J 2KV	C1050	ECUX1H050CCN	C 5PF C 50V
C843	ECEA1CGE470	E 47UF 16V	C1051	ECUX1H102KBN	C 1000PF K 50V
C844	ECA2CGE221W	E 220UF 160V	C1052	ECEAOJKG221Q	E 220UF 6.3V
C853	ECQE1224KF	P 0.22UF K 100V	C1059	ECEA1CKG470	E 47UF 16V
C861	ECOS2DB102CB	E 1000UF 200V	C1060	ECUX1H050CCN	C 5PF C 50V
C862	ECOS2CA331AB	E 330UF 160V	C1061	ECUX1H102KBN	C 1000PF K 50V
C863	ECEA1HGE222	E 2200UF 50V	C1062	ECEAOJKG221Q	E 220UF 6.3V
C864	ECOS1EA562AB	E 5600UF 25V	C1068	ECUX1H102KBN	C 1000PF K 50V
C865	ECA1CFQ222L	E 2200UF 16V	C1075	ECEA2CGE010	E 1UF 160V
C866	ECA1CXL101	E 100UF 16V	C1077	ECQE2104JF	P 0.1UF J 200V
C867	ECA1EFQ102	E 1000UF 25V	C1085	ECUX1H103KBG	C 0.01UF K 50V
C868	ECKD2H222KB5	C 2200PF K 500V	C1102	ECEA1CGE470	E 47UF 16V
C870	ECA1HFQ101	E 100UF 50V	C1103	ECUX1H103KBG	C 0.01UF K 50V
C871	ECEA1HGE221	E 220UF 50V	C1104	ECUX1H103KBG	C 0.01UF K 50V
C872	ECEA1AGE102	E 1000UF 10V	C1105	ECQV1H105JM	P 1.0UF J 50V
C873	ECUX1H104ZFX	C 0.1UF Z 50V	C1106	ECUX1H910JC	C 91PF J 50V
C874	ECUX1H104ZFX	C 0.1UF Z 50V	C1108	ECEA2DGE100	E 10UF 200V
C875	ECA1CXLV331	E 330UF 16V	C1109	ECUX1H103KBG	C 0.01UF K 50V
C876	ECEA1HGE221	E 220UF 50V	C1110	ECKD2H102KB5	C 1000PF K 500V
C877	ECUX1H104ZFX	C 0.1UF Z 50V	C1113	ECUX1H390JCG	C 39PF J 50V
C878	ECEA2DGE470	E 47UF 200V	C1114	ECQV1474JZ	P 0.47UF J 100V
C879	ECEA1AGE102	E 1000UF 10V	C1115	TACCG681P200	C 680PF 200V
C880	ECUX1H121JCG	C 120PF J 50V	C1130	ECUX1H220JCN	C 22PF J 50V
C881	ECUX1H102JCG	C 1000PF J 50V	C1140	ECUX1C105ZFW	C 1.0UF Z 16V
C882	ECUX1H221JCG	C 220PF J 50V	C1150	ECUX1H050CCN	C 5PF C 50V
C883	ECEA1EGE470	E 47UF 25V	C1151	ECUX1H102KBN	C 1000PF K 50V
C884	ECUX1H222KBN	C 2200PF K 50V	C1152	ECEAOJKG221Q	E 220UF 6.3V
C885	ECKD2H272KB5	C 2700PF K 500V	C1159	ECEA1CKG470	E 47UF 16V

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
C1160	ECUX1H050CCN	C 5PF C 50V	C1383	TACCU103P200	C 0.01UF 200V
C1161	ECUX1H102KBN	C 1000PF K 50V	C1385	ECUX1H103KBG	C 0.01UF K 50V
C1162	ECEAOJKG221Q	E 220UF 6.3V	C1386	TCUX2H101JCM	C 100PF J 500V
C1168	ECUX1H102KBN	C 1000PF K 50V	C1391	ECUX1H103KBG	C 0.01UF K 50V
C1175	ECEA2CGEO10	E 1UF 160V	C1395	ECKD2H332KB5	C 3300PF K 500V
C1177	ECQE2104JF	P 0.1UF J 200V	C1398	ECEA1HKG010	E 1UF 50V
C1185	ECUX1H103KBG	C 0.01UF K 50V	C1399	ECEA1HKG010	E 1UF 50V
C1202	ECEA1CGE470	E 47UF 16V	C1410	ECUX1C105ZFW	C 1.0UF Z 16V
C1203	ECUX1H103KBG	C 0.01UF K 50V		RESISTORS	
C1204	ECUX1H103KBG	C 0.01UF K 50V	J052	ERDS2TCO	C 0 OHM 1/4W
C1205	ECQV1H105JM	P 1.0UF J 50V	J053	ERDS2TCO	C 0 OHM 1/4W
C1206	ECUX1H820JCG	C 82PF J 50V	J054	ERDS2TCO	C 0 OHM 1/4W
C1209	ECUX1H103KBG	C 0.01UF K 50V	J055	ERDS2TCO	C 0 OHM 1/4W
C1210	ECKD2H102KB5	C 1000PF K 500V	J101	ERDS2TCO	C 0 OHM 1/4W
C1213	ECUX1H390JCG	C 39PF J 50V	J112	ERDS2TCO	C 0 OHM 1/4W
C1214	ECQV1474JZ	P 0.47UF J 100V	J114	ERDS2TCO	C 0 OHM 1/4W
C1215	TACCG681P200	C 680PF 200V	J119	ERDS2TCO	C 0 OHM 1/4W
C1230	ECUX1H220JCN	C 22PF J 50V	J120	ERDS2TCO	C 0 OHM 1/4W
C1240	ECUX1C105ZFW	C 1.0UF Z 16V	J121	ERDS2TCO	C 0 OHM 1/4W
C1250	ECUX1H050CCN	C 5PF C 50V	J122	ERDS2TCO	C 0 OHM 1/4W
C1251	ECUX1H102KBN	C 1000PF K 50V	J123	ERDS2TCO	C 0 OHM 1/4W
C1252	ECEAOJKG221Q	E 220UF 6.3V	J130	ERDS2TCO	C 0 OHM 1/4W
C1259	ECEA1CKG470	E 47UF 16V	J131	ERDS2TCO	C 0 OHM 1/4W
C1260	ECUX1H050CCN	C 5PF C 50V	J132	ERDS2TCO	C 0 OHM 1/4W
C1261	ECUX1H102KBN	C 1000PF K 50V	J133	ERDS2TCO	C 0 OHM 1/4W
C1262	ECEAOJKG221Q	E 220UF 6.3V	J134	ERDS2TCO	C 0 OHM 1/4W
C1268	ECUX1H102KBN	C 1000PF K 50V	J135	ERDS2TCO	C 0 OHM 1/4W
C1275	ECEA2CGEO10	E 1UF 160V	J136	ERDS2TCO	C 0 OHM 1/4W
C1277	ECQE2104JF	P 0.1UF J 200V	J138	ERDS2TCO	C 0 OHM 1/4W
C1285	ECUX1H103KBG	C 0.01UF K 50V	J147	ERDS2TCO	C 0 OHM 1/4W
C1301	ECEA1HGE100	E 10UF 50V	J149	ERDS2TCO	C 0 OHM 1/4W
C1302	ECUX1H103KBG	C 0.01UF K 50V	J153	ERDS2TCO	C 0 OHM 1/4W
C1303	ECEA1CGE101	E 100UF 16V	J200	ERJ8GCRYOR00	M 0 OHM 1/8W
C1304	ECEA1CGE102	E 1000UF 16V	J201	ERD25TCO	C 0 OHM 1/4W
C1305	ECQV1H474JM	P 0.47UF J 50V	J201	ERJ8GCRYOR00	M 0 OHM 1/8W
C1306	ECUX1C105ZFW	C 1.0UF Z 16V	J202	ERD25TCO	C 0 OHM 1/4W
C1307	ECUX1H100DCN	C 10PF D 50V	J202	ERJ8GCRYOR00	M 0 OHM 1/8W
C1308	ECUX1H103KBG	C 0.01UF K 50V	J203	ERD25TCO	C 0 OHM 1/4W
C1309	ECUX1H102KBN	C 1000PF K 50V	J203	ERJ8GCRYOR00	M 0 OHM 1/8W
C1310	ECEA2CGE470	E 47UF 160V	J204	ERD25TCO	C 0 OHM 1/4W
C1311	ECUX1H103KBG	C 0.01UF K 50V	J204	ERJ8GCRYOR00	M 0 OHM 1/8W
C1312	ECUX1C105ZFW	C 1.0UF Z 16V	J205	ERD25TCO	C 0 OHM 1/4W
C1314	ECEA1CGE470	E 47UF 16V	J205	ERJ8GCRYOR00	M 0 OHM 1/8W
C1315	ECUX1H103KBG	C 0.01UF K 50V	J206	ERD25TCO	C 0 OHM 1/4W
C1316	ECUX1H103KBG	C 0.01UF K 50V	J206	ERJ8GCRYOR00	M 0 OHM 1/8W
C1318	ECUX1H103KBG	C 0.01UF K 50V	J207	ERJ8GCRYOR00	M 0 OHM 1/8W
C1319	ECEA1HGE100	E 10UF 50V	J208	ERJ8GCRYOR00	M 0 OHM 1/8W
C1320	ECUX1H220JCN	C 22PF J 50V	J209	ERJ8GCRYOR00	M 0 OHM 1/8W
C1321	ECUX1H220JCN	C 22PF J 50V	J210	ERD25TCO	C 0 OHM 1/4W
C1322	ECUX1H220JCN	C 22PF J 50V	J210	ERJ8GCRYOR00	M 0 OHM 1/8W
C1323	ECEA1AGE101	E 100UF 10V	J211	ERJ8GCRYOR00	M 0 OHM 1/8W
C1324	ECUX1H220JCN	C 22PF J 50V	J212	ERD25TCO	C 0 OHM 1/4W
C1325	ECEA1CGE101	E 100UF 16V	J212	ERJ8GCRYOR00	M 0 OHM 1/8W
C1326	ECUX1H223KBX	C 0.022UF K 50V	J213	ERJ8GCRYOR00	M 0 OHM 1/8W
C1328	ECUX1H101JCG	C 100PF J 50V	J214	ERJ8GCRYOR00	M 0 OHM 1/8W
C1336	ECUX1H060DCN	C 6PF D 50V	J215	ERJ8GCRYOR00	M 0 OHM 1/8W
C1338	ECUX1H101JCG	C 100PF J 50V	J216	ERD25TCO	C 0 OHM 1/4W
C1350	ECUX1H102KBN	C 1000PF K 50V	J216	ERJ8GCRYOR00	M 0 OHM 1/8W
C1351	ECUX1H102KBN	C 1000PF K 50V	J217	ERD25TCO	C 0 OHM 1/4W
C1352	TACCG102P200	C 1000PF 200V	J217	ERJ8GCRYOR00	M 0 OHM 1/8W
C1381	ECUX1H103KBG	C 0.01UF K 50V	J218	ERJ8GCRYOR00	M 0 OHM 1/8W
C1382	ECEA2DGE100	E 10UF 200V			

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
J219	ERD25TCO	C O OHM 1/4W	J401	ERJ8GCMYOROO	M O OHM 1/8W
J219	ERJ8GCMYOROO	M O OHM 1/8W	J402	ERJ8GCMYOROO	M O OHM 1/8W
J220	ERJ8GCMYOROO	M O OHM 1/8W	J403	ERJ8GCMYOROO	M O OHM 1/8W
J221	ERD25TCO	C O OHM 1/4W	J404	ERJ8GCMYOROO	M O OHM 1/8W
J221	ERJ8GCMYOROO	M O OHM 1/8W	J405	ERJ8GCMYOROO	M O OHM 1/8W
J222	ERD25TCO	C O OHM 1/4W	J406	ERJ8GCMYOROO	M O OHM 1/8W
J222	ERJ8GCMYOROO	M O OHM 1/8W	J407	ERJ8GCMYOROO	M O OHM 1/8W
J223	ERD25TCO	C O OHM 1/4W	J408	ERJ8GCMYOROO	M O OHM 1/8W
J223	ERJ8GCMYOROO	M O OHM 1/8W	J409	ERJ8GCMYOROO	M O OHM 1/8W
J224	ERJ8GCMYOROO	M O OHM 1/8W	J410	ERJ8GCMYOROO	M O OHM 1/8W
J225	ERD25TCO	C O OHM 1/4W	J411	ERJ8GCMYOROO	M O OHM 1/8W
J225	ERJ8GCMYOROO	M O OHM 1/8W	J412	ERJ8GCMYOROO	M O OHM 1/8W
J226	ERJ8GCMYOROO	M O OHM 1/8W	J413	ERJ8GCMYOROO	M O OHM 1/8W
J229	ERD25TCO	C O OHM 1/4W	J414	ERJ8GCMYOROO	M O OHM 1/8W
J230	ERD25TCO	C O OHM 1/4W	J415	ERJ8GCMYOROO	M O OHM 1/8W
J231	ERD25TCO	C O OHM 1/4W	J417	ERJ8GCMYOROO	M O OHM 1/8W
J232	ERD25TCO	C O OHM 1/4W	J418	ERJ8GCMYOROO	M O OHM 1/8W
J233	ERD25TCO	C O OHM 1/4W	J419	ERJ8GCMYOROO	M O OHM 1/8W
J234	ERD25TCO	C O OHM 1/4W	J420	ERJ8GCMYOROO	M O OHM 1/8W
J235	ERD25TCO	C O OHM 1/4W	J421	ERJ8GCMYOROO	M O OHM 1/8W
J236	ERD25TCO	C O OHM 1/4W	J422	ERJ8GCMYOROO	M O OHM 1/8W
J237	ERD25TCO	C O OHM 1/4W	J423	ERJ8GCMYOROO	M O OHM 1/8W
J238	ERD25TCO	C O OHM 1/4W	J424	ERJ8GCMYOROO	M O OHM 1/8W
J239	ERD25TCO	C O OHM 1/4W	J425	ERJ8GCMYOROO	M O OHM 1/8W
J240	ERD25TCO	C O OHM 1/4W	J426	ERJ6GEYOROO	M O OHM 1/10W
J241	ERD25TCO	C O OHM 1/4W	J427	ERJ8GCMYOROO	M O OHM 1/8W
J242	ERD25TCO	C O OHM 1/4W	J428	ERJ8GCMYOROO	M O OHM 1/8W
J243	ERD25TCO	C O OHM 1/4W	J429	ERJ8GCMYOROO	M O OHM 1/8W
J244	ERD25TCO	C O OHM 1/4W	J430	ERJ8GCMYOROO	M O OHM 1/8W
J246	ERD25TCO	C O OHM 1/4W	J431	ERJ8GCMYOROO	M O OHM 1/8W
J247	ERD25TCO	C O OHM 1/4W	J432	ERJ8GCMYOROO	M O OHM 1/8W
J248	ERD25TCO	C O OHM 1/4W	J433	ERJ8GCMYOROO	M O OHM 1/8W
J250	ERD25TCO	C O OHM 1/4W	J434	ERJ8GCMYOROO	M O OHM 1/8W
J250	ERJ6GEYOROO	M O OHM 1/10W	J435	ERJ8GCMYOROO	M O OHM 1/8W
J251	ERD25TCO	C O OHM 1/4W	J436	ERJ8GCMYOROO	M O OHM 1/8W
J251	ERJ6GEYOROO	M O OHM 1/10W	J437	ERJ8GCMYOROO	M O OHM 1/8W
J252	ERD25TCO	C O OHM 1/4W	J438	ERJ8GCMYOROO	M O OHM 1/8W
J252	ERJ6GEYOROO	M O OHM 1/10W	J439	ERJ8GCMYOROO	M O OHM 1/8W
J253	ERJ6GEYOROO	M O OHM 1/10W	J440	ERJ8GCMYOROO	M O OHM 1/8W
J255	ERD25TCO	C O OHM 1/4W	J441	ERJ8GCMYOROO	M O OHM 1/8W
J258	ERD25TCO	C O OHM 1/4W	J442	ERJ8GCMYOROO	M O OHM 1/8W
J260	ERD25TCO	C O OHM 1/4W	J443	ERJ8GCMYOROO	M O OHM 1/8W
J261	ERD25TCO	C O OHM 1/4W	J444	ERJ8GCMYOROO	M O OHM 1/8W
J264	ERD25TCO	C O OHM 1/4W	J445	ERJ8GCMYOROO	M O OHM 1/8W
J265	ERD25TCO	C O OHM 1/4W	J446	ERJ8GCMYOROO	M O OHM 1/8W
J268	ERD25TCO	C O OHM 1/4W	J447	ERJ8GCMYOROO	M O OHM 1/8W
J271	ERD25TCO	C O OHM 1/4W	J448	ERJ8GCMYOROO	M O OHM 1/8W
J272	ERD25TCO	C O OHM 1/4W	J449	ERJ8GCMYOROO	M O OHM 1/8W
J273	ERD25TCO	C O OHM 1/4W	J450	ERJ8GCMYOROO	M O OHM 1/8W
J274	ERD25TCO	C O OHM 1/4W	J451	ERJ6GEYOROO	M O OHM 1/10W
J276	ERD25TCO	C O OHM 1/4W	J452	ERJ6GEYOROO	M O OHM 1/10W
J280	ERD25TCO	C O OHM 1/4W	J454	ERJ6GEYOROO	M O OHM 1/10W
J301	ERD25TCO	C O OHM 1/4W	J455	ERJ6GEYOROO	M O OHM 1/10W
J302	ERD25TCO	C O OHM 1/4W	J456	ERJ6GEYOROO	M O OHM 1/10W
J303	ERD25TCO	C O OHM 1/4W	J460	ERJ6GEYOROO	M O OHM 1/10W
J304	ERD25TCO	C O OHM 1/4W	J461	ERJ6GEYOROO	M O OHM 1/10W
J307	ERD25TCO	C O OHM 1/4W	J462	ERJ6GEYOROO	M O OHM 1/10W
J311	ERD25TCO	C O OHM 1/4W	J463	ERJ6GEYOROO	M O OHM 1/10W
J313	ERD25TCO	C O OHM 1/4W	J465	ERJ6GEYOROO	M O OHM 1/10W
J318	ERD25TCO	C O OHM 1/4W	J466	ERJ6GEYOROO	M O OHM 1/10W
J322	ERD25TCO	C O OHM 1/4W	J467	ERJ6GEYOROO	M O OHM 1/10W
J326	ERD25TCO	C O OHM 1/4W	J469	ERJ6GEYOROO	M O OHM 1/10W

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
J470	ERJ6GEYOR00	M O OHM 1/10W	R208	ERJ6GEYJ472	M 4.7K OHM J 1/10W
J471	ERJ6GEYOR00	M O OHM 1/10W	R212	ERJ6GEYJ182	M 1.8K OHM J 1/10W
J472	ERJ6GEYOR00	M O OHM 1/10W	R214	ERJ6GEYJ472	M 4.7K OHM J 1/10W
J473	ERJ6GEYOR00	M O OHM 1/10W	R215	ERJ6GEYJ102	M 1K OHM J 1/10W
J474	ERJ6GEYOR00	M O OHM 1/10W	R217	ERJ6GEYJ222	M 2.2K OHM J 1/10W
J475	ERJ6GEYOR00	M O OHM 1/10W	R218	ERJ6GEYJ562	M 5.6K OHM J 1/10W
J476	ERJ6GEYOR00	M O OHM 1/10W	R219	ERJ12YJ391	M 390 OHM J 1/2W
J478	ERJ6GEYOR00	M O OHM 1/10W	R220	ERDS1FJ331	C 330 OHM J 1/2W
J479	ERJ6GEYOR00	M O OHM 1/10W	R221	ERJ6GEYJ222	M 2.2K OHM J 1/10W
J480	ERJ6GEYOR00	M O OHM 1/10W	R223	ERJ6GEYJ102	M 1K OHM J 1/10W
J481	ERJ6GEYOR00	M O OHM 1/10W	R224	ERJ6ENF2702	M 27K OHM F 1/10W
J482	ERJ6GEYOR00	M O OHM 1/10W	R225	ERJ6ENF2433	M 243K OHM F 1/10W
J483	ERJ6GEYOR00	M O OHM 1/10W	R239	ERJ6GEYJ101	M 100 OHM J 1/10W
J485	ERJ6GEYOR00	M O OHM 1/10W	R241	ERJ6GEYJ222	M 2.2K OHM J 1/10W
J486	ERJ6GEYOR00	M O OHM 1/10W	R242	ERJ6GEYJ103	M 10K OHM J 1/10W
J487	ERJ6GEYOR00	M O OHM 1/10W	R244	ERJ6GEYJ222	M 2.2K OHM J 1/10W
J488	ERJ6GEYOR00	M O OHM 1/10W	R245	ERJ6GEYJ101	M 100 OHM J 1/10W
J489	ERJ6GEYOR00	M O OHM 1/10W	R247	ERJ6GEYJ101	M 100 OHM J 1/10W
J490	ERJ6GEYOR00	M O OHM 1/10W	R248	ERJ6GEYJ101	M 100 OHM J 1/10W
J491	ERJ6GEYOR00	M O OHM 1/10W	R249	ERJ6GEYJ101	M 100 OHM J 1/10W
J492	ERJ6GEYOR00	M O OHM 1/10W	R250	ERJ6GEYJ392	M 3.9K OHM J 1/10W
J493	ERJ6GEYOR00	M O OHM 1/10W	R251	ERJ6GEYJ562	M 5.6K OHM J 1/10W
J495	ERJ6GEYOR00	M O OHM 1/10W	R252	ERJ6GEYJ104	M 100K OHM J 1/10W
J501	ERJ8GCRYOR00	M O OHM 1/8W	R253	ERJ6GEYJ104	M 100K OHM J 1/10W
J502	ERJ8GCRYOR00	M O OHM 1/8W	R260	ERDS2TJ471	C 470 OHM J 1/4W
J504	ERJ8GCRYOR00	M O OHM 1/8W	R261	ERDS2TJ471	C 470 OHM J 1/4W
J505	ERJ8GCRYOR00	M O OHM 1/8W	R262	ERJ6GEYJ103	M 10K OHM J 1/10W
J506	ERJ8GCRYOR00	M O OHM 1/8W	R263	ERJ6GEYJ103	M 10K OHM J 1/10W
J508	ERJ8GCRYOR00	M O OHM 1/8W	R264	ERJ6GEYJ101	M 100 OHM J 1/10W
J509	ERJ8GCRYOR00	M O OHM 1/8W	R265	ERJ6GEYJ101	M 100 OHM J 1/10W
J510	ERJ8GCRYOR00	M O OHM 1/8W	R266	ERDS2TJ471	C 470 OHM J 1/4W
J511	ERJ8GCRYOR00	M O OHM 1/8W	R267	ERDS2TJ471	C 470 OHM J 1/4W
J512	ERJ8GCRYOR00	M O OHM 1/8W	R268	ERJ6GEYJ103	M 10K OHM J 1/10W
J513	ERJ8GCRYOR00	M O OHM 1/8W	R269	ERJ6GEYJ103	M 10K OHM J 1/10W
J518	ERJ8GCRYOR00	M O OHM 1/8W	R270	ERJ6GEYJ101	M 100 OHM J 1/10W
J522	ERJ8GCRYOR00	M O OHM 1/8W	R271	ERJ6GEYJ101	M 100 OHM J 1/10W
J524	ERJ8GCRYOR00	M O OHM 1/8W	R279	ERJ8GCRYJ184	M 180K OHM J 1/8W
J525	ERJ8GCRYOR00	M O OHM 1/8W	R280	ERJ12YJ184	M 180K OHM J 1/2W
J526	ERJ8GCRYOR00	M O OHM 1/8W	R281	ERJ12YJ184	M 180K OHM J 1/2W
J527	ERJ8GCRYOR00	M O OHM 1/8W	R282	ERJ12YJ184	M 180K OHM J 1/2W
J870	ERJ8GCRYOR00	M O OHM 1/8W	R283	ERJ12YJ184	M 180K OHM J 1/2W
J901	ERDS2TCO	C O OHM 1/4W	R285	ERDS1FJ394	C 390K OHM J 1/2W
J902	ERDS2TCO	C O OHM 1/4W	R286	ERJ6ENF1822	M 18.2K OHM F 1/10W
J1301	ERD25TCO	C O OHM 1/4W	R287	ERJ6GEYJ474	M 470K OHM J 1/10W
J1302	ERD25TCO	C O OHM 1/4W	R288	ERC12GJ565	S 5.6M OHM J 1/2W
J1303	ERDS2TCO	C O OHM 1/4W	R289	ERC12GJ565	S 5.6M OHM J 1/2W
J1304	ERDS2TCO	C O OHM 1/4W	R290	ERJ6ENF8062	M 80.6K OHM F 1/10W
R101	ERJ6ENF6042	M 60.4K OHM F 1/10W	R291	ERJ6ENF6981	M 6.98K OHM F 1/10W
R102	ERJ6ENF6982	M 69.8K OHM F 1/10W	R292	ERJ6ENF5902	M 59K OHM F 1/10W
R103	ERJ6ENF3742	M 37.4K OHM F 1/10W	R293	ERJ6ENF1132	M 11.3K OHM F 1/10W
R105	ERJ6GEYJ102	M 1K OHM J 1/10W	R294	ERC12GJ565	S 5.6M OHM J 1/2W
R106	ERJ6GEYJ681	M 680 OHM J 1/10W	R295	ERDS1FJ103	C 10K OHM J 1/2W
R108	ERJ6ENF1741	M 1.74K OHM F 1/10W	R299	ERJ6GEYJ152	M 1.5K OHM J 1/10W
R109	ERJ6ENF3321	M 3.32K OHM F 1/10W	R301	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R111	ERJ6GEYJ272	M 2.7K OHM J 1/10W	R302	ERJ6GEYJ152	M 1.5K OHM J 1/10W
R113	ERJ6GEYJ272	M 2.7K OHM J 1/10W	R303	ERDS1FJ104	C 100K OHM J 1/2W
R114	ERDS2TJ2R7	C 2.7 OHM J 1/4W	R304	ERDS1FJ273	C 27K OHM J 1/2W
R203	ERJ6GEYJ472	M 4.7K OHM J 1/10W	R305	ERJ6GEYJ103	M 10K OHM J 1/10W
R204	ERJ6GEYJ472	M 4.7K OHM J 1/10W	R306	ERJ6GEYJ103	M 10K OHM J 1/10W
R205	ERJ6GEYK106	M 10M OHM K 1/10W	R307	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R206	ERJ6GEYJ472	M 4.7K OHM J 1/10W	R308	ERJ6GEYJ474	M 470K OHM J 1/10W
R207	ERJ6GEYJ472	M 4.7K OHM J 1/10W	R311	ERJ6ENF5621	M 5.62K OHM F 1/10W

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R312	ERJ6ENF5621	M 5.62K OHM F 1/10W	R388	ERJ6ENF5362	M 53.6K OHM F 1/10W
R314	EROS2CKF2211	M 2.21K OHM F 1/4W	R389	ERJ6ENF2322	M 23.2K OHM F 1/10W
R315	EROS2CKF1502	M 15K OHM F 1/4W	R390	ERJ6GEYJ123	M 12K OHM J 1/10W
R316	ERG1SJ104	M 100K OHM J 1W	R391	ERJ6GEYJ562	M 5.6K OHM J 1/10W
R317	ERG1SJ104	M 100K OHM J 1W	R400	ERJ6GEYJ332	M 3.3K OHM J 1/10W
R318	ERDS2TJ434	C 430K OHM J 1/4W	R401	ERJ6GEYJ272	M 2.7K OHM J 1/10W
R318A	ERDS2TJ434	C 430K OHM J 1/4W	R402	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R319	ERJ6GEYJ821	M 820 OHM J 1/10W	R403	ERJ6ENF3013	M 301K OHM F 1/10W
R321	ERDS1FJ103	C 10K OHM J 1/2W	R420	ERJ6ENF8661	M 8.66K OHM F 1/10W
R322	ERDS2TJ102	C 1K OHM J 1/4W	R421	ERJ6ENF5110	M 511 OHM F 1/10W
R323	ERQ14AJ101	F 100 OHM J 1/4W	R440	ERJ6GEYJ333	M 33K OHM J 1/10W
R324	ERQ14AJ181	F 180 OHM J 1/4W	R441	ERJ6GEYJ182	M 1.8K OHM J 1/10W
R325	ERDS2TJ222	C 2.2K OHM J 1/4W	R442	ERJ6GEYOR00	M 0 OHM J 1/10W
R326	ERDS2TJ333	C 33K OHM J 1/4W	R444	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R327	ERDS1FJ474	C 470K OHM J 1/2W	R445	ERJ6GEYJ102	M 1K OHM J 1/10W
R328	ERDS1FJ564	C 560K OHM J 1/2W	R446	ERDS1FJ391	C 390 OHM J 1/2W
R329	ERDS1FJ474	C 470K OHM J 1/2W	R447	ERJ6GEYJ153	M 15K OHM J 1/10W
R330	ERJ6ENF1003	M 100K OHM F 1/10W	R448	ERJ6GEYJ822	M 8.2K OHM J 1/10W
R331	ERJ6ENF1871	M 1.87K OHM F 1/10W	R451	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R332	ERJ6ENF4022	M 40.2K OHM F 1/10W	R456	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R333	ERJ6ENF1373	M 137K OHM F 1/10W	R457	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R334	ERJ6GEYJ102	M 1K OHM J 1/10W	R458	ERJ6GEYJ822	M 8.2K OHM J 1/10W
R335	ERJ6ENF2211	M 2.21K OHM F 1/10W	R459	ERJ6ENF1583	M 158K OHM F 1/10W
R336	ERDS1FJ125	C 1.2M OHM J 1/2W	R460	ERD25FJ101K	C 100 OHM J 1/4W
R337	ERDS2TJ102	C 1K OHM J 1/4W	R461	ERJ6ENF1101	M 1.1K OHM F 1/10W
R338	ERJ6ENF7501	M 7.5K OHM F 1/10W	R462	ERJ6ENF5621	M 5.62K OHM F 1/10W
R339	ERDS2TJ102	C 1K OHM J 1/4W	R463	ERJ6ENF3321	M 3.32K OHM F 1/10W
R340	ERJ6GEYJ123	M 12K OHM J 1/10W	R464	ERJ6ENF2211	M 2.21K OHM F 1/10W
R341	ERJ6GEYOR00	M 0 OHM J 1/10W	R465	ERD25FJ222K	C 2.2K OHM J 1/4W
R342	ERJ6GEYJ681	M 680 OHM J 1/10W	R466	ERJ6ENF3651	M 3.65K OHM F 1/10W
R343	ERJ6GEYJ272	M 2.7K OHM J 1/10W	R467	ERJ6ENF2741	M 2.74K OHM F 1/10W
R344	ERJ6GEYJ332	M 3.3K OHM J 1/10W	R468	ERJ6ENF7872	M 78.7K OHM F 1/10W
R345	ERJ6GEYJ104	M 100K OHM J 1/10W	R469	ERJ6ENF2102	M 21K OHM F 1/10W
R349	ERJ6ENF1002	M 10K OHM F 1/10W	R470	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R350	ERJ6ENF1372	M 13.7K OHM F 1/10W	R471	ERJ6GEYJ152	M 1.5K OHM J 1/10W
R351	ERDS1FJ104	C 100K OHM J 1/2W	R472	ERJ6GEYJ682	M 6.8K OHM J 1/10W
R352	ERDS1FJ104	C 100K OHM J 1/2W	R473	ERJ6GEYJ122	M 1.2K OHM J 1/10W
R353	ERJ6ENF5901	M 5.9K OHM F 1/10W	R474	ERJ6GEYJ333	M 33K OHM J 1/10W
R354	ERJ6GEYJ123	M 12K OHM J 1/10W	R475	ERJ6ENF4021	M 4.02K OHM F 1/10W
R356	ERJ6GEYJ563	M 56K OHM J 1/10W	R476	ERJ6GEYJ153	M 15K OHM J 1/10W
R357	ERDS1FJ104	C 100K OHM J 1/2W	R477	ERJ6GEYJ103	M 10K OHM J 1/10W
R361	ERJ6GEYJ562	M 5.6K OHM J 1/10W	R478	ERJ6ENF2001	M 2K OHM F 1/10W
R362	ERJ6GEYJ392	M 3.9K OHM J 1/10W	R479	ERJ6ENF1002	M 10K OHM F 1/10W
R363	ERDS1FJ151	C 150 OHM J 1/2W	R480	ERQ14AJ330	F 33 OHM J 1/4W
R368	ERJ6GEYJ103	M 10K OHM J 1/10W	R481	ERJ6GEYJ103	M 10K OHM J 1/10W
R369	ERJ6GEYJ103	M 10K OHM J 1/10W	R482	ERJ6ENF1002	M 10K OHM F 1/10W
R371	ERJ6GEYJ682	M 6.8K OHM J 1/10W	R483	ERJ6ENF1202	M 12K OHM F 1/10W
R372	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R484	ERJ6ENF7502	M 75K OHM F 1/10W
R373	ERJ6ENF6811	M 6.81K OHM F 1/10W	R485	ERQ1CJP4R7S	F 4.7 OHM J 1W
R374	ERJ6GEYJ682	M 6.8K OHM J 1/10W	R486	ERDS1FJ751	C 750 OHM J 1/2W
R375	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R487	ERDS1FJ751	C 750 OHM J 1/2W
R376	ERJ6ENF2001	M 2K OHM F 1/10W	R488	ERDS1FJ751	C 750 OHM J 1/2W
R377	ERDS2TJ510	C 51 OHM J 1/4W	R489	ERJ6ENF1001	M 1K OHM F 1/10W
R378	ERJ6ENF1001	M 1K OHM F 1/10W	R490	ERJ6ENF3921	M 3.92K OHM F 1/10W
R379	ERDS2TJ510	C 51 OHM J 1/4W	R491	ERJ6ENF2261	M 2.26K OHM F 1/10W
R380	ERDS2TJ121	C 120 OHM J 1/4W	R492	ERJ6GEYJ470	M 47 OHM J 1/10W
R381	ERJ6ENF8251	M 8.25K OHM F 1/10W	R493	ERX2SG1R0	M 1 OHM G 2W
R382	ERJ6ENF1212	M 12.1K OHM F 1/10W	R494	ERD25FJ3R3K	C 3.3 OHM J 1/4W
R383	ERJ6ENF4021	M 4.02K OHM F 1/10W	R495	ERD25FJ3R3K	C 3.3 OHM J 1/4W
R384	ERJ6ENF1961	M 1.96K OHM F 1/10W	R496	ERG3FJ680	M 68 OHM J 3W
R385	ERJ6GEYJ332	M 3.3K OHM J 1/10W	R497	ERDS2TJ332	C 3.3K OHM J 1/4W
R386	ERJ6GEYJ272	M 2.7K OHM J 1/10W	R498	ERG3FJ470	M 47 OHM J 3W

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R499	ERQ14AJ1R0	F 1 OHM J 1/4W	R607	ERG3FJ822	M 8.2K OHM J 3W
R502	ERJ6GEYJ472	M 4.7K OHM J 1/10W	R608	ERG1SJ104	M 100K OHM J 1W
R504	ERJ6GEYJ123	M 12K OHM J 1/10W	R609	ERG1SJ823	M 82K OHM J 1W
R505	ERJ8GCVJ153	M 15K OHM J 1/8W	R610	ERJ12YJ104	M 100K OHM J 1/2W
R506	ERJ6GEYJ561	M 560 OHM J 1/10W	R611	ERJ12YJ104	M 100K OHM J 1/2W
R507	ERJ6GEYJ472	M 4.7K OHM J 1/10W	R620	ERJ6GEYJ104	M 100K OHM J 1/10W
R508	ERJ6GEYJ562	M 5.6K OHM J 1/10W	R621	ERDS1FJ224	C 220K OHM J 1/2W
R509	ERJ6GEYJ223	M 22K OHM J 1/10W	R622	ERDS1FJ224	C 220K OHM J 1/2W
R510	ERJ6ENF4221	M 4.22K OHM F 1/10W	R625	ERJ6GEYOR00	M 0 OHM 1/10W
R511	ERJ6ENF5111	M 5.11K OHM F 1/10W	R630	ERJ6GEYJ183	M 18K OHM J 1/10W
R512	ERJ6ENF1502	M 15K OHM F 1/10W	R631	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R516	ERJ6ENF1821	M 1.82K OHM F 1/10W	R633	ERJ6GEYJ101	M 100 OHM J 1/10W
R518	ERJ6GEYJ332	M 3.3K OHM J 1/10W	R634	ERJ6ENF1002	M 10K OHM F 1/10W
R520	ERJ6ENF1051	M 1.05K OHM F 1/10W	R636	ERJ6ENF5361	M 5.36K OHM F 1/10W
R521	ERJ6GEYJ104	M 100K OHM J 1/10W	R637	ERJ6ENF1582	M 15.8K OHM F 1/10W
R522	ERJ6ENF9091	M 9.09K OHM F 1/10W	R638	ERJ6ENF4641	M 4.64K OHM F 1/10W
R523	ERJ6GEYJ333	M 33K OHM J 1/10W	R640	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R524	ERDS1FJ470	C 47 OHM J 1/2W	R641	ERJ6GEYJ101	M 100 OHM J 1/10W
R525	ERJ6ENF1001	M 1K OHM F 1/10W	R642	ERJ6GEYJ101	M 100 OHM J 1/10W
R526	ERJ6ENF2553	M 255K OHM F 1/10W	R644	ERD25FJ100K	C 10 OHM J 1/4W
R527	ERJ6GEYJ104	M 100K OHM J 1/10W	R645	ERD25FJ100K	C 10 OHM J 1/4W
R528	ERJ6GEYJ122	M 1.2K OHM J 1/10W	R646	ERD25FJ220K	C 22 OHM J 1/4W
R529	ERJ6GEYJ682	M 6.8K OHM J 1/10W	R650	ERJ6ENF3921	M 3.92K OHM F 1/10W
R530	ERJ6GEYJ223	M 22K OHM J 1/10W	R651	ERJ6ENF3921	M 3.92K OHM F 1/10W
R539	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R652	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R542	ERJ8ENF3241	M 3.24K OHM F 1/8W	R653	ERJ6GEYJ102	M 1K OHM J 1/10W
R543	ERJ8GCVJ563	M 56K OHM J 1/8W	R656	ERJ6GEYJ102	M 1K OHM J 1/10W
R544	ERJ8ENF1332	M 13.3K OHM F 1/8W	R657	ERJ6GEYJ103	M 10K OHM J 1/10W
R545	TARRS5B151J2	M 150 OHM J 5W	R658	ERJ6GEYJ153	M 15K OHM J 1/10W
R547	ERJ6GEYJ470	M 47 OHM J 1/10W	R659	ERJ6GEYJ102	M 1K OHM J 1/10W
R548	ERJ6GEYJ332	M 3.3K OHM J 1/10W	R660	ERJ6ENF2741	M 2.74K OHM F 1/10W
R549	ERG1SJ561	M 560 OHM J 1W	R661	ERJ6GEYJ124	M 120K OHM J 1/10W
R551	ERX2SJ1R5	M 1.5 OHM J 2W	R662	ERJ6GEYJ152	M 1.5K OHM J 1/10W
R552	ERX2SJ1R8	M 1.8 OHM J 2W	R663	ERJ6GEYJ103	M 10K OHM J 1/10W
R554	ERX3FJX6R8D	M 6.8 OHM J 3W	R664	ERJ6GEYJ103	M 10K OHM J 1/10W
R560	ERJ8GCVJ472	M 4.7K OHM J 1/8W	R665	ERJ6GEYJ103	M 10K OHM J 1/10W
R561	ERJ6GEYJ680	M 68 OHM J 1/10W	R666	ERJ6GEYJ273	M 27K OHM J 1/10W
R563	ERJ8GCVJ472	M 4.7K OHM J 1/8W	R667	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R564	ERJ6GEYJ680	M 68 OHM J 1/10W	R668	ERJ6GEYJ104	M 100K OHM J 1/10W
R566	ERJ8GCVJ472	M 4.7K OHM J 1/8W	R669	ERJ6GEYJ392	M 3.9K OHM J 1/10W
R567	ERJ6GEYJ680	M 68 OHM J 1/10W	R672	ERDS2TJ102	C 1K OHM J 1/4W
R571	ERJ6GEYJ562	M 5.6K OHM J 1/10W	R674	ERDS1FJ391	C 390 OHM J 1/2W
R572	ERJ6GEYJ562	M 5.6K OHM J 1/10W	R675	ERQ14AJ101	F 100 OHM J 1/4W
R573	ERDS1FJ221	C 220 OHM J 1/2W	R676	ERQ14AJ101	F 100 OHM J 1/4W
R574	ERDS1FJ121	C 120 OHM J 1/2W	R678	ERJ12YJ220	M 22 OHM J 1/2W
R575	ERJ6GEYJ101	M 100 OHM J 1/10W	R679	ERJ6GEYJ104	M 100K OHM J 1/10W
R576	ERJ6GEYJ101	M 100 OHM J 1/10W	R680	ERJ6GEYJ104	M 100K OHM J 1/10W
R577	ERJ6GEYJ101	M 100 OHM J 1/10W	R685	ERJ12YJ121	M 120 OHM J 1/2W
R580	EROS1CKF5112	M 51.1K OHM F 1/2W	R686	ERJ12YJ121	M 120 OHM J 1/2W
R581	EROS2CKF1152	M 11.5K OHM F 1/4W	R687	ERJ12YJ121	M 120 OHM J 1/2W
R582	EROS1CKF5112	M 51.1K OHM F 1/2W	R690	ERJ6GEYJ104	M 100K OHM J 1/10W
R583	EROS2CKF6491	M 6.49K OHM F 1/4W	R691	ERJ6ENF2103	M 210K OHM F 1/10W
R584	ERDS1FJ562	C 5.6K OHM J 1/2W	R692	ERJ6GEYJ223	M 22K OHM J 1/10W
R586	EROS2CKF1211	M 1.21K OHM F 1/4W	R693	ERJ6ENF5621	M 5.62K OHM F 1/10W
R587	ERDS2TJ332	C 3.3K OHM J 1/4W	R694	ERJ6ENF2053	M 205K OHM F 1/10W
R588	TARRS5B150J2	M 15 OHM J 5W	R695	ERJ6ENF1102	M 11K OHM F 1/10W
R589	TARRS5B150J2	M 15 OHM J 5W	R696	ERJ12YJ104	M 100K OHM J 1/2W
R599	ERQ12HJ220	F 22 OHM J 1/2W	R697	ERJ12YJ104	M 100K OHM J 1/2W
R601	ERG2SJ151	M 150 OHM J 2W	R698	ERJ6GEYJ221	M 220 OHM J 1/10W
R602	ERQ14AJ100	F 10 OHM J 1/4W	R699	ERJ12YJ331	M 330 OHM J 1/2W
R605	ERD25FJ100K	C 10 OHM J 1/4W	R702	ERJ6GEYJ103	M 10K OHM J 1/10W
R606	ERG3FJ822	M 8.2K OHM J 3W	R703	ERJ6GEYJ393	M 39K OHM J 1/10W

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R704	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R838	ERJ6GEYJ102	M 1K OHM J 1/10W
R706	ERJ6GEYJ221	M 220 OHM J 1/10W	R839	ERJ6GEYJ102	M 1K OHM J 1/10W
R708	ERJ6GEYJ823	M 82K OHM J 1/10W	R840	ERQ1CKPR39S	F 0.39 OHM K 1W
R709	ERJ6GEYJ101	M 100 OHM J 1/10W	R841	ERQ12AJR33HK	F 0.33 OHM J 1/2W
R714	ERJ6ENF1541	M 1.54K OHM F 1/10W	R842	ERQ12HJ1R2	F 1.2 OHM J 1/2W
R715	EROS2CKF5620	M 562 OHM F 1/4W	R843	ERQ12AJR12HK	F 0.12 OHM J 1/2W
R717	ERDS1FJ332	C 3.3K OHM J 1/2W	R844	ERQ12AJR12HK	F 0.12 OHM J 1/2W
R718	ERDS1FJ332	C 3.3K OHM J 1/2W	R845	TAR18BKOR11Z	F 0.11 OHM K 1/4W
R720	ERJ6GEYJ104	M 100K OHM J 1/10W	R846	ERJ12YJ471	M 470 OHM J 1/2W
R741	ERJ6ENF1002	M 10K OHM F 1/10W	R847	ERJ12YJ122	M 1.2K OHM J 1/2W
R742	ERJ8ENF1692	M 16.9K OHM F 1/8W	R848	ERJ6GEYJ103	M 10K OHM J 1/10W
R751	ERJ6ENF1001	M 1K OHM F 1/10W	R849	ERJ6GEYJ103	M 10K OHM J 1/10W
R752	ERJ6ENF2553	M 255K OHM F 1/10W	R850	ERJ12YJ103	M 10K OHM J 1/2W
R753	ERJ6ENF1001	M 1K OHM F 1/10W	R851	ERJ6GEYJ102	M 1K OHM J 1/10W
R754	ERJ6ENF2553	M 255K OHM F 1/10W	R852	ERJ6GEYJ103	M 10K OHM J 1/10W
R767	ERJ6GEYJ392	M 3.9K OHM J 1/10W	R853	ERJ8GCRYJ473	M 47K OHM J 1/8W
R768	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R854	ERX3FJX2R2D	M 2.2 OHM J 3W
R773	ERJ6ENF3922	M 39.2K OHM F 1/10W	R855	ERJ6ENF3401	M 3.4K OHM F 1/10W
R774	ERJ6GEYJ332	M 3.3K OHM J 1/10W	R856	ERJ6GEYJ333	M 33K OHM J 1/10W
R775	ERQ14AJ100	F 10 OHM J 1/4W	R858	ERJ12YJ222	M 2.2K OHM J 1/2W
R777	ERJ6GEYJ103	M 10K OHM J 1/10W	R859	ERJ12YJ222	M 2.2K OHM J 1/2W
R778	ERJ8GCRYJ682	M 6.8K OHM J 1/8W	R860	ERJ6GEYJ103	M 10K OHM J 1/10W
R779	ERJ6ENF2941	M 2.94K OHM F 1/10W	R861	TAR18BKOR47Z	F 0.47 OHM K 1/4W
R789	ERJ6GEYJ392	M 3.9K OHM J 1/10W	R862	ERJ6ENF1002	M 10K OHM F 1/10W
R790	ERJ6GEYJ682	M 6.8K OHM J 1/10W	R863	ERJ6GEYJ101	M 100 OHM J 1/10W
R799	ERJ6GEYJ102	M 1K OHM J 1/10W	R864	ERJ6GEYJ683	M 68K OHM J 1/10W
R801	ERC12AGK394	S 390K OHM K 1/2W	R865	ERDS1FJ224	C 220K OHM J 1/2W
R802	ERJ6GEYJ273	M 27K OHM J 1/10W	R866	ERQ12HJ271	F 270 OHM J 1/2W
R803	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R867	ERJ6ENF3741	M 3.74K OHM F 1/10W
R805	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R868	ERJ6ENF6651	M 6.65K OHM F 1/10W
R806	ERJ6GEYJ102	M 1K OHM J 1/10W	R869	ERJ6ENF4221	M 4.22K OHM F 1/10W
R807	ERJ8GCRYJ562	M 5.6K OHM J 1/8W	R870	ERJ6GEYJ103	M 10K OHM J 1/10W
R808	ERJ6GEYJ471	M 470 OHM J 1/10W	R871	ERJ6GEYJ103	M 10K OHM J 1/10W
R809	ERJ12YJ473	M 47K OHM J 1/2W	R872	ERJ6GEYJ103	M 10K OHM J 1/10W
R810	ERJ6GEYJ391	M 390 OHM J 1/10W	R873	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R811	ERDS1FJ224	C 220K OHM J 1/2W	R874	ERJ6GEYJ392	M 3.9K OHM J 1/10W
R812	ERDS1FJ274	C 270K OHM J 1/2W	R875	ERJ6GEYJ104	M 100K OHM J 1/10W
R813	ERJ6GEYJ152	M 1.5K OHM J 1/10W	R876	ERJ6ENF5110	M 511 OHM F 1/10W
R814	ERJ6GEYJ151	M 150 OHM J 1/10W	R877	ERJ6GEYJ562	M 5.6K OHM J 1/10W
R815	ERJ6GEYJ681	M 680 OHM J 1/10W	R878	ERJ6GEYJ823	M 82K OHM J 1/10W
R816	ERJ6ENF3011	M 3.01K OHM F 1/10W	R879	ERG1SJ683	M 68K OHM J 1W
R817	ERQ12AJ6R8	F 6.8 OHM J 1/2W	R880	ERJ6ENF1211	M 1.21K OHM F 1/10W
R818	ERJ6GEYOR00	M 0 OHM 1/10W	R881	ERJ6ENF2211	M 2.21K OHM F 1/10W
R819	ERDS2TJ224	C 220K OHM J 1/4W	R882	ERDS2TJ102	C 1K OHM J 1/4W
R820	ERDS2TJ224	C 220K OHM J 1/4W	R883	ERQ12HJ391	F 390 OHM J 1/2W
R821	TARRS3B333J2	M 33K OHM J 3W	R884	ERJ6GEYJ104	M 100K OHM J 1/10W
R822	ERJ6GEYJ182	M 1.8K OHM J 1/10W	R885	ERQ14AJ101	F 100 OHM J 1/4W
R823	ERJ6GEYJ102	M 1K OHM J 1/10W	R886	ERQ14AJ101	F 100 OHM J 1/4W
R824	ERJ8GCRYJ681	M 680 OHM J 1/8W	R887	ERJ12YJ220	M 22 OHM J 1/2W
R825	ERJ6GEYJ821	M 820 OHM J 1/10W	R888	ERJ6GEYJ104	M 100K OHM J 1/10W
R826	ERJ6GEYJ101	M 100 OHM J 1/10W	R889	ERJ6GEYJ822	M 8.2K OHM J 1/10W
R827	ERJ6ENF2431	M 2.43K OHM F 1/10W	R890	ERX3FJX1R6D	M 1.6 OHM J 3W
R828	ERJ12YJ223	M 22K OHM J 1/2W	R891	TRPF5BOM090A	POSISTOR
R829	ERJ6GEYJ102	M 1K OHM J 1/10W	R892	ERDS1FJ470	C 47 OHM J 1/2W
R830	ERJ6GEYJ332	M 3.3K OHM J 1/10W	R893	ERDS1FJ221	C 220 OHM J 1/2W
R831	ERJ6GEYJ473	M 47K OHM J 1/10W	R894	ERJ6GEYJ390	M 39 OHM J 1/10W
R832	ERJ6GEYJ103	M 10K OHM J 1/10W	R895	ERJ6GEYJ102	M 1K OHM J 1/10W
R833	ERJ6GEYJ102	M 1K OHM J 1/10W	R896	ERJ12YJ102	M 1K OHM J 1/2W
R834	ERW2PKR12	W 0.12 OHM K 2W	R897	ERJ12YJ104	M 100K OHM J 1/2W
R835	ERDS1FJ224	C 220K OHM J 1/2W	R898	ERJ12YJ104	M 100K OHM J 1/2W
R836	ERG2SJ223	M 22K OHM J 2W	R899	ERJ12YJ104	M 100K OHM J 1/2W
R837	ERG2SJ223	M 22K OHM J 2W	R901	ERJ6GEYJ103	M 10K OHM J 1/10W

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R902	ERJ6GEYJ682	M 6.8K OHM J 1/10W	R1029	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R903	ERDS2TJ562	C 5.6K OHM J 1/4W	R1030	ERJ6GEYJ154	M 150K OHM J 1/10W
R908	ERJ6GEYJ102	M 1K OHM J 1/10W	R1031	ERDS2TCO	C 0 OHM 1/4W
R918	ERJ6GEYJ101	M 100 OHM J 1/10W	R1040	ERJ6ENF1101	M 1.1K OHM F 1/10W
R923	ERJ6GEYJ103	M 10K OHM J 1/10W	R1041	ERJ6ENF2371	M 2.37K OHM F 1/10W
R930	ERJ6GEYJ103	M 10K OHM J 1/10W	R1042	ERJ6ENF6810	M 681 OHM F 1/10W
R932	ERJ6GEYJ101	M 100 OHM J 1/10W	R1043	ERJ6ENF9531	M 9.53K OHM F 1/10W
R933	ERJ6GEYJ101	M 100 OHM J 1/10W	R1044	ERJ6ENF3241	M 3.24K OHM F 1/10W
R937	ERJ6GEYJ102	M 1K OHM J 1/10W	R1045	ERJ6ENF1501	M 1.5K OHM F 1/10W
R938	ERJ6GEYJ102	M 1K OHM J 1/10W	R1046	ERJ6GEYJ101	M 100 OHM J 1/10W
R939	ERJ6GEYJ102	M 1K OHM J 1/10W	R1047	ERJ6GEYJ101	M 100 OHM J 1/10W
R940	ERJ6GEYJ223	M 22K OHM J 1/10W	R1050	EROS2CKF84R5	M 84.5 OHM F 1/4W
R941	ERJ6GEYJ223	M 22K OHM J 1/10W	R1051	ERJ6GEYJ820	M 82 OHM J 1/10W
R943	ERJ6GEYJ103	M 10K OHM J 1/10W	R1055	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R944	ERJ6GEYJ103	M 10K OHM J 1/10W	R1056	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R945	ERJ6GEYJ103	M 10K OHM J 1/10W	R1058	ERJ6GEYJ152	M 1.5K OHM J 1/10W
R946	ERJ8GCVJ271	M 270 OHM J 1/8W	R1059	ERDS2TJ330	C 33 OHM J 1/4W
R947	ERJ6GEYJ751	M 750 OHM J 1/10W	R1060	EROS2CKF84R5	M 84.5 OHM F 1/4W
R949	ERJ6GEYJ223	M 22K OHM J 1/10W	R1061	ERJ6GEYJ820	M 82 OHM J 1/10W
R950	ERJ6GEYJ223	M 22K OHM J 1/10W	R1065	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R951	ERJ6GEYJ223	M 22K OHM J 1/10W	R1066	ERJ6GEYJ472	M 4.7K OHM J 1/10W
R952	ERJ6GEYJ223	M 22K OHM J 1/10W	R1075	ERDS2TJ224	C 220K OHM J 1/4W
R960	ERJ6GEYJ103	M 10K OHM J 1/10W	R1076	ERJ6GEYJ103	M 10K OHM J 1/10W
R962	ERJ6GEYJ103	M 10K OHM J 1/10W	R1077	ERJ6GEYJ102	M 1K OHM J 1/10W
R963	ERJ6GEYJ103	M 10K OHM J 1/10W	R1080	ERJ6ENF1202	M 12K OHM F 1/10W
R969	ERJ6GEYJ334	M 330K OHM J 1/10W	R1081	ERJ6ENF2052	M 20.5K OHM F 1/10W
R970	ERJ6GEYJ334	M 330K OHM J 1/10W	R1082	ERJ6ENF1002	M 10K OHM F 1/10W
R971	ERJ6GEYJ334	M 330K OHM J 1/10W	R1083	ERJ6ENF2702	M 27K OHM F 1/10W
R973	ERDS2TJ103	C 10K OHM J 1/4W	R1104	ERJ6GEYJ101	M 100 OHM J 1/10W
R974	ERDS2TJ103	C 10K OHM J 1/4W	R1106	ERJ6GEYJ220	M 22 OHM J 1/10W
R975	ERDS2TJ103	C 10K OHM J 1/4W	R1109	ERJ6ENF7870	M 787 OHM F 1/10W
R977	ERJ6GEYJ223	M 22K OHM J 1/10W	R1110	ERJ6ENF5600	M 560 OHM F 1/10W
R978	ERJ6GEYJ392	M 3.9K OHM J 1/10W	R1111	ERJ6ENF39R0	M 39 OHM F 1/10W
R979	ERJ6GEYJ392	M 3.9K OHM J 1/10W	R1113	EROS2CKF4702	M 47K OHM F 1/4W
R981	ERJ6GEYJ333	M 33K OHM J 1/10W	R1114	EROS2CKF3091	M 3.09K OHM F 1/4W
R982	ERJ6GEYJ101	M 100 OHM J 1/10W	R1116	ERJ6ENF8200	M 820 OHM F 1/10W
R983	ERJ6GEYJ101	M 100 OHM J 1/10W	R1118	ERJ8GCVJ331	M 330 OHM J 1/8W
R984	ERJ6GEYJ101	M 100 OHM J 1/10W	R1119	ERG2SJ123	M 12K OHM J 2W
R985	ERJ6GEYJ101	M 100 OHM J 1/10W	R1120	ERJ6ENF1002	M 10K OHM F 1/10W
R995	ERJ6GEYJ101	M 100 OHM J 1/10W	R1121	ERJ6ENF1002	M 10K OHM F 1/10W
R997	ERJ6ENF1001	M 1K OHM F 1/10W	R1122	ERDS1FJ220	C 22 OHM J 1/2W
R998	ERJ6ENF2553	M 255K OHM F 1/10W	R1123	ERDS2TJ102	C 1K OHM J 1/4W
R999	ERJ6GEYJ103	M 10K OHM J 1/10W	R1124	ERJ6GEYJ123	M 12K OHM J 1/10W
R1004	ERJ6GEYJ101	M 100 OHM J 1/10W	R1125	ERJ6ENF1202	M 12K OHM F 1/10W
R1006	ERJ6GEYJ220	M 22 OHM J 1/10W	R1126	EROS2CKF2262	M 22.6K OHM F 1/4W
R1009	ERJ6ENF7870	M 787 OHM F 1/10W	R1127	ERJ6ENF1002	M 10K OHM F 1/10W
R1010	ERJ6ENF5600	M 560 OHM F 1/10W	R1128	ERJ6ENF7680	M 768 OHM F 1/10W
R1011	ERJ6ENF39R0	M 39 OHM F 1/10W	R1129	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R1013	EROS2CKF4702	M 47K OHM F 1/4W	R1130	ERJ6GEYJ154	M 150K OHM J 1/10W
R1014	EROS2CKF3091	M 3.09K OHM F 1/4W	R1131	ERDS2TJ101	C 100 OHM J 1/4W
R1016	ERJ6ENF8200	M 820 OHM F 1/10W	R1140	ERJ6ENF1101	M 1.1K OHM F 1/10W
R1018	ERJ8GCVJ331	M 330 OHM J 1/8W	R1141	ERJ6ENF2371	M 2.37K OHM F 1/10W
R1019	ERG2SJ123	M 12K OHM J 2W	R1142	ERJ6ENF6810	M 681 OHM F 1/10W
R1020	ERJ6ENF1002	M 10K OHM F 1/10W	R1143	ERJ6ENF9531	M 9.53K OHM F 1/10W
R1021	ERJ6ENF1002	M 10K OHM F 1/10W	R1144	ERJ6ENF3241	M 3.24K OHM F 1/10W
R1022	ERDS1FJ220	C 22 OHM J 1/2W	R1145	ERJ6ENF1501	M 1.5K OHM F 1/10W
R1023	ERDS2TJ102	C 1K OHM J 1/4W	R1146	ERJ6GEYJ101	M 100 OHM J 1/10W
R1024	ERJ6GEYJ123	M 12K OHM J 1/10W	R1147	ERJ6GEYJ101	M 100 OHM J 1/10W
R1025	ERJ6ENF1202	M 12K OHM F 1/10W	R1150	EROS2CKF84R5	M 84.5 OHM F 1/4W
R1026	EROS2CKF2262	M 22.6K OHM F 1/4W	R1151	ERJ6GEYJ820	M 82 OHM J 1/10W
R1027	ERJ6ENF1002	M 10K OHM F 1/10W	R1155	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R1028	ERJ6ENF7680	M 768 OHM F 1/10W	R1156	ERJ6GEYJ472	M 4.7K OHM J 1/10W

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R1158	ERJ6GEYJ152	M 1.5K OHM J 1/10W	R1302	ERJ6GEYJ102	M 1K OHM J 1/10W
R1159	ERDS2TJ330	C 33 OHM J 1/4W	R1303	ERJ6GEYJ152	M 1.5K OHM J 1/10W
R1160	EROS2CKF84R5	M 84.5 OHM F 1/4W	R1304	ERDS2TJ102	C 1K OHM J 1/4W
R1161	ERJ6GEYJ820	M 82 OHM J 1/10W	R1305	ERJ6ENF1002	M 10K OHM F 1/10W
R1165	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R1306	ERJ6ENF1002	M 10K OHM F 1/10W
R1166	ERJ6GEYJ472	M 4.7K OHM J 1/10W	R1307	ERJ6GEYJ151	M 150 OHM J 1/10W
R1170	ERDS2TJ122	C 1.2K OHM J 1/4W	R1308	ERJ6GEYJ102	M 1K OHM J 1/10W
R1175	ERDS2TJ224	C 220K OHM J 1/4W	R1312	ERJ6GEYJ102	M 1K OHM J 1/10W
R1176	ERJ6GEYJ103	M 10K OHM J 1/10W	R1313	ERJ6GEYJ102	M 1K OHM J 1/10W
R1177	ERJ6GEYJ102	M 1K OHM J 1/10W	R1314	ERJ6GEYJ331	M 330 OHM J 1/10W
R1180	EROS2CKF1202	M 12K OHM F 1/4W	R1315	ERJ6GEYJ474	M 470K OHM J 1/10W
R1181	ERJ6ENF2052	M 20.5K OHM F 1/10W	R1316	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R1182	ERJ6ENF1002	M 10K OHM F 1/10W	R1317	ERJ6GEYJ912	M 9.1K OHM J 1/10W
R1183	ERJ6ENF2702	M 27K OHM F 1/10W	R1318	ERJ6GEYJ682	M 6.8K OHM J 1/10W
R1204	ERJ6GEYJ101	M 100 OHM J 1/10W	R1320	ERJ6ENF2701	M 2.7K OHM F 1/10W
R1206	ERJ6GEYJ220	M 22 OHM J 1/10W	R1322	ERJ6GEYJ100	M 10 OHM J 1/10W
R1209	ERJ6ENF7870	M 787 OHM F 1/10W	R1324	ERJ6GEYJ103	M 10K OHM J 1/10W
R1210	ERJ6ENF5600	M 560 OHM F 1/10W	R1325	ERJ6GEYJ223	M 22K OHM J 1/10W
R1211	ERJ6ENF47R0	M 47 OHM F 1/10W	R1326	ERJ6GEYJ223	M 22K OHM J 1/10W
R1213	EROS2CKF4702	M 47K OHM F 1/4W	R1327	ERJ6GEYJ103	M 10K OHM J 1/10W
R1214	EROS2CKF3091	M 3.09K OHM F 1/4W	R1328	ERJ6GEYJ102	M 1K OHM J 1/10W
R1216	ERJ6ENF8200	M 820 OHM F 1/10W	R1329	ERJ6GEYJ102	M 1K OHM J 1/10W
R1218	ERJ8GCVJ331	M 330 OHM J 1/8W	R1331	ERJ6ENF1962	M 19.6K OHM F 1/10W
R1219	ERG2SJ123	M 12K OHM J 2W	R1332	ERJ6ENF1002	M 10K OHM F 1/10W
R1220	ERJ6ENF1002	M 10K OHM F 1/10W	R1333	ERJ12YJ681	M 680 OHM J 1/2W
R1221	ERJ6ENF1002	M 10K OHM F 1/10W	R1336	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R1222	ERDS1FJ220	C 22 OHM J 1/2W	R1337	ERJ6GEYJ102	M 1K OHM J 1/10W
R1223	ERDS2TJ102	C 1K OHM J 1/4W	R1338	ERJ6GEYJ561	M 560 OHM J 1/10W
R1224	ERJ6GEYJ123	M 12K OHM J 1/10W	R1339	ERJ6GEYJ102	M 1K OHM J 1/10W
R1225	ERJ6ENF1202	M 12K OHM F 1/10W	R1340	ERJ12YJ681	M 680 OHM J 1/2W
R1226	EROS2CKF2262	M 22.6K OHM F 1/4W	R1341	ERJ12YJ681	M 680 OHM J 1/2W
R1227	ERJ6ENF1002	M 10K OHM F 1/10W	R1342	ERJ6GEYJ220	M 22 OHM J 1/10W
R1228	ERJ6ENF7680	M 768 OHM F 1/10W	R1381	ERJ6GEYJ682	M 6.8K OHM J 1/10W
R1229	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R1385	ERJ6GEYJ474	M 470K OHM J 1/10W
R1230	ERJ6GEYJ154	M 150K OHM J 1/10W	R1390	ERDS1FJ561	C 560 OHM J 1/2W
R1231	ERDS2TC0	C 0 OHM 1/4W	R1391	ERJ6GEYJ682	M 6.8K OHM J 1/10W
R1240	ERJ6ENF1101	M 1.1K OHM F 1/10W	R1392	ERG1SJ123	M 12K OHM J 1W
R1241	ERJ6ENF2371	M 2.37K OHM F 1/10W	R1395	ERJ6GEYJ474	M 470K OHM J 1/10W
R1242	ERJ6ENF6810	M 681 OHM F 1/10W	R1396	ERJ6GEYJ222	M 2.2K OHM J 1/10W
R1243	ERJ6ENF9531	M 9.53K OHM F 1/10W	R1401	ERJ6GEYJ331	M 330 OHM J 1/10W
R1244	ERJ6ENF3241	M 3.24K OHM F 1/10W	R1402	ERJ6ENF2702	M 27K OHM F 1/10W
R1245	ERJ6ENF1501	M 1.5K OHM F 1/10W	R1403	ERJ6ENF3301	M 3.3K OHM F 1/10W
R1246	ERJ6GEYJ101	M 100 OHM J 1/10W	R1404	ERJ6ENF2212	M 22.1K OHM F 1/10W
R1247	ERJ6GEYJ101	M 100 OHM J 1/10W	R1405	ERJ6ENF5621	M 5.62K OHM F 1/10W
R1250	EROS2CKF84R5	M 84.5 OHM F 1/4W	R1406	ERJ6ENF8203	M 820K OHM F 1/10W
R1251	ERJ6GEYJ820	M 82 OHM J 1/10W	R1408	ERJ6ENF1002	M 10K OHM F 1/10W
R1255	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R1409	ERJ6ENF1002	M 10K OHM F 1/10W
R1256	ERJ6GEYJ472	M 4.7K OHM J 1/10W	R1410	ERJ6GEYJ124	M 120K OHM J 1/10W
R1258	ERJ6GEYJ152	M 1.5K OHM J 1/10W	Z1051A	ERJ6GEYOR00	M 0 OHM 1/10W
R1259	ERDS2TJ330	C 33 OHM J 1/4W	Z1061A	ERJ6GEYOR00	M 0 OHM 1/10W
R1260	EROS2CKF84R5	M 84.5 OHM F 1/4W	Z1151A	ERJ6GEYOR00	M 0 OHM 1/10W
R1261	ERJ6GEYJ820	M 82 OHM J 1/10W	Z1161A	ERJ6GEYOR00	M 0 OHM 1/10W
R1265	ERJ6GEYJ222	M 2.2K OHM J 1/10W	Z1251A	ERJ6GEYOR00	M 0 OHM 1/10W
R1266	ERJ6GEYJ472	M 4.7K OHM J 1/10W	Z1261A	ERJ6GEYOR00	M 0 OHM 1/10W
R1275	ERD25FJ224K	C 220K OHM J 1/4W	Z501	ERD25TC0	C 0 OHM 1/4W
R1276	ERJ6GEYJ103	M 10K OHM J 1/10W	Z502	ERD25TC0	C 0 OHM 1/4W
R1277	ERJ6GEYJ102	M 1K OHM J 1/10W		OTHERS	
R1280	ERJ6ENF1202	M 12K OHM F 1/10W		TES9148-2	SPRING(CRT PCB EARTH)
R1281	ERJ6ENF2052	M 20.5K OHM F 1/10W		TES9511	LED SPRING
R1282	ERJ6ENF1002	M 10K OHM F 1/10W		THE902N	D-SUB SCREW
R1283	ERJ6ENF2702	M 27K OHM F 1/10W		TJS8A4830	BNC TERMINAL
R1301	ERJ6GEYJ472	M 4.7K OHM J 1/10W			

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
	TJS8A9600	15P CONNECTOR(D-SUB)	△ PC832	TLP750D4	PHOTO COUPLER
	TMK87907	MICA SHEET	△ PC833	S21ME4FY	PHOTO COUPLER
	TMK87919	INSULATION SHEET	RL571	TSE80892	RELAY
	TMM16452	CLAMPER(LONG)	S290	TAG10003	SPARK GAP
	TMM7464	CLAMPER(SHORT)	S301	TAGDSP751N	SPARK GAP
	TUC87559-1	AC INLET BRACKET	S302	TAGDSP751N	SPARK GAP
	TUC87577	SHIELD PLATE(VIDEO PCB)	S691	TAGDSP201MF	SPARK GAP
	TUW85513	BNC TERMINAL BRACKET	S1001	TAGDSP201MF	SPARK GAP
	TUX86406	FBT BRACKET	S1101	TAGDSP201MF	SPARK GAP
	XTV3+12J	SCREW	S1201	TAGDSP201MF	SPARK GAP
	XTV3+16J	SCREW	△ SW801	ESB8278V	SWITCH(POWER)
	XWGT40G60	WASHER	SW901	EVQ33405R	SWITCH
	XWG3F10	WASHER	SW902	EVQ33405R	SWITCH
CL1	TMM85541	CLAMPER(SMALL)	SW903	EVQ33405R	SWITCH
△ F801	XBA2C50TB15L	FUSE(5.0A)	SW904	EVQ33405R	SWITCH
FG2	TJC85341	EARTH LUG	TP1	TEL302-9	TERMINAL
FG3	TJC85341	EARTH LUG	TP2	TEL302-9	TERMINAL
FG4	TJC85341	EARTH LUG	TP301	TEL302-9	TERMINAL
FG5	TJE85317	LUG TERMINAL	X901	TSS2165TM	CRYSTAL OSCILLATOR
FS801	TJC85502T	FUSE HOLDER			
FS803	TJC85502T	FUSE HOLDER			
JC101	TJC85341	EARTH LUG			
JC102	TJC85341	EARTH LUG			
N7A	TJS9A8291	11P CONNECTOR(L-TYPE)			
N7B	TJS9A8290	11P CONNECTOR			
N8A	TJS9A8260	9P CONNECTOR(L-TYPE)			
N8B	TJS9A8250	9P CONNECTOR			
N9A	TJS9A8220	24P CONNECTOR			
N9B	TJS9A8210	24P CONNECTOR(L-TYPE)			
N10A	EMCSO364MB	3P CONNECTOR(BLUE)			
N10B	EMCSO364MB	3P CONNECTOR(BLUE)			
N12A	TJS9A8090	25P CONNECTOR			
N12B	TJS9A8090	25P CONNECTOR			
N15A	TJS9A848A	7P CONNECTOR			
N15B	TJS9A849A	7P CONNECTOR(L-TYPE)			
N16A	EMCSO364M	3P CONNECTOR			
N16B	EMCSO351ML	3P CONNECTOR(L-TYPE)			
N101	TJS9A863A	2P CONNECTOR			
N104	TJC85342T	LUG TERMINAL			
N105	TJC85342T	LUG TERMINAL			
N106	TJC85342T	LUG TERMINAL			
N381	TJS8A5130	CRT SOCKET			
N382A	TEL302-9	TERMINAL			
N382B	TEL302-9	TERMINAL			
N511B	TJS3A8010	3P CONNECTOR			
△ N801	TJS9A9760	AC INLET			
N803A	TJS8A8570	3P CONNECTOR			
N803B	TJS8A8570	3P CONNECTOR			
N901A	TJS9A846A	8P CONNECTOR			
N901B	TJS9A847A	8P CONNECTOR(L-TYPE)			
N901C	EMCSO464M	4P CONNECTOR			
N510-1	TEL302-9	TERMINAL			
N510-2	TEL302-9	TERMINAL			
N510-3	TEL302-9	TERMINAL			
N510-4	TEL302-9	TERMINAL			
N511-1	TEL302-9	TERMINAL			
N511-2	TEL302-9	TERMINAL			
N511-3	TEL302-9	TERMINAL			
N802-1	TEL302-9	TERMINAL			
N802-2	TEL302-9	TERMINAL			
△ PC830	TLP721FD4GRH	PHOTO COUPLER			
△ PC831	TLP721FD4GR	PHOTO COUPLER			